An evaluation of the cross-border nature of cartels: The case of bitumen in Southern Africa

by

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DECLARATION

I certify that the *minor dissertation* submitted by me for the degree *Master's of Commerce (Competition and Economic Regulation)* at the University of Johannesburg is my independent work and has not been submitted by me for a degree at another university.

PRECIOUS PELOENTLE DUBE

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ABSTRACT

This paper evaluates the possible cross-border nature of a cartel uncovered and prosecuted in the bitumen industry in South Africa. The paper assesses whether the cartel in South Africa could have had an appreciable effect in the neighbouring states in the Southern Africa Customs Union (SACU) region, given their close economic integration and trade ties with South Africa. Qualitative and quantitative data analysis were undertaken to assess the possible impact of the cartel. First, a qualitative assessment of the industry stakeholders was conducted to evaluate competition in the bitumen industry within the SACU region. This covered the structural and behavioural characteristics of the industry which renders it susceptible to collusion. Second, trade data was used to demonstrate the dependency of the SACU member states on South Africa for their bitumen imports and an analysis of the pricing trends derived from the import prices was conducted. The trade data demonstrated that the SACU member states were almost wholly dependent on South Africa for their bitumen needs for the duration of the cartel, which was produced and supplied by the companies implicated in the cartel. Similar pricing trends to South Africa were also found in the SACU region. This suggests that the effects of the cartel may have extended beyond the South African borders. The contribution of the study is to highlight the significance of screening and timeously investigating cartel conduct prosecuted in neighbouring countries in cases where there is significant trade dependency, as these may have an appreciable impact on regional markets.

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CHAPTER 1: INTRODUCTION

Cartel conduct, or collusion, is when firms in a horizontal relationship have an agreement to restrict competition between each other, primarily by increasing prices, restricting output levels or allocating customers or geographical territories (Church and Ware, 2000). This conduct is often cited as the most egregious type of all anti-competitive conduct, as it usually results in the loss of consumer welfare and deadweight losses. Cartels bring harm to the overall economy by hampering the growth of firms and thus negatively affecting economic development of countries (Veljanovski, 2006). Unlike other arrangements that include forms of horizontal integration, hard core cartels generally lack any productive efficiency advantages. For this reason, collusion and cartel conduct are treated as 'per se' illegal in most countries.

Competition policies and laws of countries in Southern Africa[1] emphasise developmental goals such as job creation, poverty reduction and small business empowerment. These objectives of competition policy are in addition to the traditional efficiency rationale justifications of ensuring competitive outcomes in markets. However, in an environment where cartels are present, there is little likelihood that these objectives will be achieved. Therefore, anti-cartel enforcement is an imperative part of competition policy in the Southern African region as cartels are a direct attack on the principles of competition. Screening for, and prosecution of, cartels is therefore of importance in the region.

The apartheid heritage in South Africa and the prevalence of regulation and government support during that period resulted in an economy with concentrated industries. Nationalist policies primarily meant to enhance industrialisation in the country often resulted in markets that were highly regulated in terms of both prices and output. Post market liberalisation, many of the firms continued with this behaviour, resulting in widespread illegal cartel activity in South Africa (OECD, 2015).

In the past 15 years, the Competition Commission of South Africa (CCSA) has had considerable achievements in uncovering and prosecuting cartels, although this has subsequently declined since 2014. Collusive behaviour has been uncovered in a range of industries including

[1] For instance, other countries in Southern Africa like Namibia, eSwatini, Botswana, Zambia, Zimbabwe and Tanzania, all have developmental goals.

construction, banking, petroleum and agriculture and agro-processing. The success in uncovering activities of cartels has mainly been attributed to the implementation of the Corporate Leniency Policy[2]. However, notwithstanding the aggressive enforcement against cartels and the fines levelled against the offenders, cartel activity in the region does not seem to be on a downward trajectory (Kaira, 2015). The on-going discovery of cartels in South Africa itself indicates that they remain relatively under-deterred. In part, this may be due to discovered cartels not being sanctioned in all jurisdictions where they caused harm and the sanctions not accounting for the harm in foreign markets. This is a possible indication that profits from cartel activity in multiple countries outweighs the costs of being prosecuted in just one jurisdiction.

South Africa, as the largest (in terms of gross domestic product (GDP)) and most developed economy in the SACU region, henceforth referred to as the region, has a significant influence on various supply chains in the region. The country is a source market for direct and indirect investment in many sectors across the region (Kaira, 2015). Many South African companies operate, or have a presence in the region through direct exports. Consequently, cartels prosecuted in South Africa, have at times involved firms that also operate or have a presence in the region. This then implores the question as to whether those companies that were uncovered to have participated in cartel arrangements in South Africa could have extended those arrangements into other countries in the region in which they have operations. In addition, it also raises the question of the impact of these collusive agreements in the region, if any. Literature provides evidence that cartel members commonly engage in several collusive agreements in geographical regions that are in close proximity (Ivaldi, Jenny and Khimich, 2016). It is more likely that a firm, headed by executives that have breached antitrust laws in one market may also collude in other markets (Neyrinck, 2009). Furthermore, cross-border competition problems are often more pronounced among neighbouring countries relative to countries that are not close to each other geographically (Mehta, 2003).

Extensive links in trade and investment between South Africa and other countries, especially those in the SACU region, therefore increase the probability of a cartel in South Africa being spread to the other neighbouring states where the same businesses operate. Firms that participate in one cartel are more inclined to participate in other collusive arrangements when the same firms are involved in different markets, primarily because they develop the rapport with their

[2] The corporate leniency policy aims at eradicating and preventing cartels by setting out benefits, procedures and requirements for co-operation of cartel members with the Commission in exchange for immunity.

competitors and the organisational skills to make collusion more effective (Levenstein and Suslow, 2008). This is because even when explicit collusion ends, the nature of the agreements that existed between the firms in organizing their illegal conduct, the processes by which they monitored one another, and the mechanisms used to threaten punishment are not automatically forgotten by the former conspirators (Kovacic, Marshall, Marx and Raiff, 2007). In an adverse yet possible case, firms may cease cartel activity in South Africa, however, continue to maintain cartel activity in the other SACU member states with frail enforcement of anti-trust laws or those that do not have effective competition authorities (Kaira, 2015).

As national economies integrate into the world economy through liberalisation and with each other through regional trade agreements, barriers to trade are lowered (Qaqaya, 2008). In addition, globalisation has augmented the area coverage of transactions and with that, the cross-border impact of anti-competitive practices (Armoogum, 2018). Thus, growth in global trade increases vulnerability to foreign sources of anti-competitive behaviour. This gives rise to the possibility that cartel arrangements may extend to other geographical locations where the firms operate. There have been several examples of this internationally. For example, competition authorities have turned their attention to cartels with cross-border dimensions, resulting in the successful prosecution of cartels in graphite, lysine, citric acid, vitamins, sorbate and sodium glucomate cartels in various jurisdictions (see Jenny, 2012, Connor, 2001, Levenstein and Suslow, 2008).

While the South African authorities have achieved relative success in unearthing and prosecuting cartels since the enactment of the Corporate Leniency Policy in 2008, other competition authorities in the region have not been as successful in this regard (Kaira, 2015). There has been relatively little activity on the part of other countries in the region to respond to these cartels even after they have been uncovered in South Africa. Very little work has also been done on detecting and screening for collusive arrangements in firms with operations which transcends national borders in Africa. In addition, fewer efforts have been directed towards understanding cartel conduct with regional dimensions notwithstanding the linkages of most economies in Southern and East Africa (Roberts, Vilakazi, and Simbanegavi, 2014). This is of concern especially in SACU countries where markets are increasingly integrated, which is further compounded by the presence of multinational firms. Important to note that the SACU region does not have an effective regional competition authority, therefore the onus for any cartel investigation with regional dimensions is on the individual country authorities. Cartels uncovered in neighbouring countries with common firms are low hanging fruit for authorities to conduct cartel screening studies. Furthermore, domestic markets in the SACU region are relatively small and the desire for high

scale economies of production of certain goods may imply that firms often organise production and distribution at a regional level.

This study focuses on analysing the relationship between a specific cartel discovered and prosecuted in South Africa in the bitumen industry ('the bitumen cartel') and the neighbouring countries in the SACU region, namely Botswana, Lesotho, Namibia and eSwatini. The SACU region is a Southern African regional economic organisation. The five member states (including South Africa) maintain a common external tariff, share customs revenues, and coordinate policies and decision-making on a wide range of trade issues.

Previously a legal cartel in South Africa until its disbandment in 2000, the producers of bitumen contravened the South African competition law from September 2000 to December 2009. The companies that were prosecuted for this cartel comprised Total SA (Pty) Ltd, Sasol Limited, Engen Limited, Shell (Pty) Ltd, Tosas (Pty) Ltd, Masana Petroleum Solutions (Pty) Ltd, Chevron SA (Pty) Ltd and the industry association, Southern African Bitumen Association (SABITA). SABITA was made up of all members from the implicated oil companies. This case is suitable for analysis because the companies implicated in the cartel have operations in, or export to, the region. Moreover, this case is of importance because bitumen is a significant input into road construction and maintenance. Therefore, given the need to develop road infrastructure in the region, bitumen is a critical product. This study is the first attempt to review and assess the possible relationship and potential impact between the bitumen cartel prosecuted in South African and the SACU member states. The key objective addressed in this study is:

Could the bitumen cartel that was discovered and prosecuted in South Africa have affected the SACU region member states?

In addressing this objective, this study will specifically consider the following research questions:

1. What are the structural and behavioural characteristics of the bitumen industry in the SACU region that could have facilitated collusion?
2. How did the prices of bitumen differ between the domestic market (South Africa) and the export markets (in the rest of SACU) during and post the cartel period and what does this indicate about the possibility of regional cartel activity?
3. What could have been the possible impact of the South African bitumen cartel in the SACU member states?
4. What lessons can be drawn for screening for regional cartels?

In terms of this cartel, investigations were not extended to markets in the SACU member states to inquire whether markets were cartelised or directly affected by the cartel uncovered in South Africa. This is despite the possibility that the cartel that was uncovered in South Africa could have been facilitated by the bounds of the common customs union which make the movement of goods between South Africa and its SACU neighbours more attractive. This is further facilitated by relatively shorter distances between the countries. These factors, along with the same players implicated in the South African cartel, render it plausible that firms could have developed strategies at a regional level given the bulky nature of the bitumen plants and the importance of securing sufficiently large localised markets to ensure offtake and scale.

This study will undertake basic screening using trade data trends and pricing data of bitumen between South Africa and Botswana, Lesotho, Namibia and eSwatini during and post the uncovering of the cartel in South Africa to analyse the impact of the cartel on the SACU member states. This impact is either through exports from South Africa to these countries or through similar arrangements entered into by the same companies in these countries. This research contributes to the literature of the cross-border dimension of cartels by using a combination of trade data and assessing qualitative factors to screen for a cartel uncovered in one jurisdiction which could have had significant effects in other jurisdictions with close trade links.

The study used mixed qualitative and quantitative methods for analyses. Qualitatively, it maps out the structure of the bitumen value chain in the SACU region and the major suppliers across the countries. Semi-structured interviews with stakeholders in the bitumen industry from the SACU region were undertaken to get insights into the competitive landscape in bitumen markets, as well as to inform structural and other forms of behavioural screening. The quantitative methods employed included the analysis of the trade data and relative country prices, and evaluating if these are more consistent with competition or collusion. The study primarily adopts screening approaches as proposed in the literature review by Harrington (2006) and assessments of trade data as proposed by Levenstein and Suslow (2012).

This dissertation is organised as follows - a literature review on the economics of cartels, cross-border cartels and screening of cartels is undertaken in Chapter 2. The literature on calculating cartel overcharges is also presented here. Chapter 3 describes the research methodology employed and the data used in this dissertation. Chapter 4 firstly provides the background to the bitumen cartel case that was uncovered and prosecuted in South Africa. It then presents the findings of the analysis of whether the bitumen cartel that was uncovered in South Africa could

have potentially extended to the SACU region member states. Chapter 5 concludes, summarising key findings and putting forward policy proposals.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The research seeks to evaluate the cross-border dimensions of the bitumen cartel. This Chapter begins with the foundations of cartels and collusive agreements in Section 2.2. Once the foundation is laid, the literature on regional cartels or cartels with regional dimensions is assessed in Section 2.3. The discussion then considers the main reasons for anti-trust authorities in the SACU countries to investigate the possible impact of uncovered and successfully prosecuted cartels in South Africa, particularly in cases which involve the same firms operating in the region. A discussion on the literature on screening and cartel overcharges is finally undertaken in Sections 2.4 and 2.5 respectively. This forms the foundation of the analysis conducted in this dissertation. Section 2.6 concludes.

2.2 The economics of cartels

Collusion or cartel behaviour refers to conduct by companies with the purpose of jointly maximising profits through the coordination of the activities of firms. This occurs when a collective of companies in the same line of business, supplying similar products or services concludes an arrangement to fix prices and or to split the market and increase prices for customers. Accordingly, the collusive equilibrium is one in which the prices are above the competitive price levels. This harms consumers who are subjected to higher prices and often reduced consumption (Motta, 2004).

Firms also join cartels to grow their power in the market by working collectively to fix output levels to be produced by each member and/or prices to be charged to customers. Cartels grant companies in a market collective market power to cooperate in determining prices, dividing the market or production, allocating clients and territorial markets. With respects to price-fixing, cooperation by the cartelists may include collective action to determine a minimum selling price, terminate discounts and enforce a uniform formula for calculating prices (Church and Ware, 2000). Contrary to other forms of independent conduct by companies which also cause prices to increase to levels more than the competitive price levels, cartel arrangements depend on communications between the firms (Motta, 2004). The theoretical definition of collusion is consistent with features of explicit collusion. Explicit collusion is when firms intentionally

coordinate their actions through an agreement and monitor the agreement through constant communication. Consequently, explicit collusion involves overt communication and discussions between firms in the form of documents, meetings and telephone calls.

On the other hand, tacit collusion is coordination without direct communication. Tacit collusive arrangements happen when companies collectively adjust their prices through their awareness of competitors pricing trends. This occurs when all companies observe each other's collective interlinkages as well as gains from collusive action, thus firms anticipate that rivals will match any increase in prices or decline in output. The existence of an explicit agreement between the colluding firms is the fundamental distinction separating explicit and tacit collusion. Unlike explicit collusion, which is prohibited in law by many jurisdictions, tacit collusion is not prohibited in competition law, hence companies implicated in tacit collusion are not liable for fines, even though tacit collusion often results in economic harm identical to that of explicit collusion (Garrod and Olczak, 2018).

As noted, cartel agreements are generally acknowledged as one of the most detrimental forms of anti-competitive behaviour. They differ from other prohibited arrangements in that they constrain competition without producing any other balancing benefits (Klimašauskienė and Giedraitis, 2011). In addition, cartel conduct has no redeeming features as it is aimed at reducing competition in order to make excess profits or to avoid losses. Therefore, negative effects of cartels in the economy and consumer welfare are considerable. This significant harm is identifiable in the way in which anti-trust authorities handle cartel conduct in various jurisdictions. Cartel conduct is illegal in almost all jurisdictions, although laws and enforcement vary across the globe. In South Africa, the Competition Act No. 89 of 1998 as amended prohibits cartel conduct under Section 4.

Cartels are harmful to consumers, as cartelised industries do not exhibit competition, which diminishes competitiveness and has adverse effects on general economic activity of a country. The lack of competition is when firms jointly coordinate their actions while competitiveness is about the companies' ability to do better than others through innovation. Cartels change market dynamics, often resulting in sluggish innovation because colluding firms which charge higher prices have little incentive to invest in research and development (Günster, Carree and van Dijk, 2011). Cartels also lead to allocative inefficiencies (this occurs when consumers do not pay an efficient price), umbrella effects and non-price harm to quality and variety (Connor, 2008). Umbrella effects occur when the existence of a cartel permits non-colluding firms to charge higher prices under the cartel price. This has an adverse effect on all final consumers paying prices

above competitive levels (Connor, 2008). However, often the poor suffer disproportionately from the effects of collusion as high prices, particularly those of essential goods and services, force the poor to consume less or none of the cartelised goods. It is for these reasons that the detection and prosecution of cartels is given high priority especially in developing countries, like those in the SACU region where there is a higher proportion of poor people.

Nevertheless, reasons have been provided on the benefits of cartels. There have been assertions that cartel conduct is beneficial to avoid damaging competitive behaviour in industries with large sunk costs. This was the argument in the US Trans-Missouri case where eighteen railroad companies formed an association to fix rates, on the basis that competition will not be beneficial for the final consumers (Veljanovski, 2006). In the South African bitumen price-fixing case under study, as will be discussed in Chapter 4, the oil companies also argued that due to the nature of the bitumen industry, the consumers of bitumen desired a fixed and more transparent pricing mechanism (Boshoff, 2015). There are provisions in the South African Competition Act under section 4 (1) (a) that allow for a rule of reason evaluation in cartel cases for efficiency justification. However, the bitumen cartel case was not found to fall within the purview of this section. Moreover, the prosecuted companies did not apply for an exemption to continue coordinating following the ending of the legal cartel.

Another theoretical case for non-intervention in cartels is that they are inherently unsteady and short-term in nature and consequently, are often not regarded as being serious (Veljanovski, 2006). Game theory suggests that cartels are generally unstable and may be short-lived. The behaviour of members in a cartel is an example of the well-known prisoner's dilemma. Each member of the cartel faces a conflict of interest. By producing more output than it has agreed to produce and by undercutting on the agreed price, a cartel member can increase its share of cartel profits. Hence, there is an inherent incentive for each cartel member to cheat on the agreement and undercut prices by selling more units (Motta, 2004). However, some game theorists such as Benoit and Krishna (1984) have argued, in contrast, that repeated interaction over time or across markets could deter firms from cheating by providing higher future collusive profits. The probability of cheating and the consequent deviation from the collusive agreement relies on the future benefits from the collusive agreement being greater than benefits from cheating on the collusive agreement with prospects of facing severe punishment. Empirical evidence from prosecuted cartels shows that cartelists are often able to overcome material differences which cause instability as cartels often exhibit longer duration. This can be observed from a study by Connor

(2004) on 167 cartels discovered after 1990 which found that the average duration of cartels is six years.

Industrial organisation economists have identified a number of factors relating to market structure and market behaviour which might facilitate collusion. The factors and characteristics which make collusion easier to maintain in various markets have been outlined by several authors (see Stigler, 1964, Symeonidis, 2003, Connor, 2008 and Grout and Sonderegger, 2005). Cartel conduct is more likely in market structures with homogenous products, high concentration of firms, high barriers to entry, stable demand conditions, a history of a legal collusion, high ratio of fixed to variable costs, transparency in pricing and symmetry among firms, multi-market contact between firms, existence of a trade association and cross ownership among firms (Church and Ware, 2000). Some of these factors will be elaborated in Chapter 4 under the section on structural analysis.

In terms of market behaviour, certain outcomes indicate that collusion may have occurred, for instance, when there is low observable variance in prices over time, high levels of price transparency maintained between players, strong correlation in prices without corresponding increases in input costs and highly stable market shares over time for the individual firms (Harrington, 2006). Information exchange between competitors increases market transparency which facilitates collusion. It reduces strategic uncertainty about competitors' behaviour, allowing for better and more effective monitoring of cartelist deviating from the collusive agreement. It also allows for more targeted punishment of deviators (das Nair and Mncube, 2012). Several of these market characteristics, such as concentration of firms, a history of collusion, a homogenous product, high barriers to entry, multimarket contact and a trade association are present in the market for bitumen in the SACU region as will be discussed in Chapter 4.

2.3 Cross-border cartels

Connor (2011) defines international cartels as those that operate across different geographical locations, noting a difference between private international cartels and those that are government directed or sponsored. Examples of the latter are the export cartel arrangement like the Organisation of Petroleum Exporting Countries (OPEC) and cartels registered in terms of the Webb-Pomerene Act in the United States (US). In general, cross-border cartel conduct is comparable to cartel conduct that is geographically localised, the principal and obvious difference being that the anti-competitive behaviour or effects in cross-border cartels transcends national borders.

Literature provides reasons for why firms would organise as cartels to do business across borders. It is argued that coordination among firms permits small and medium-sized firms to collectively access global markets, which they are unable to access individually. The pooling of their resources allows the firms to establish joint-selling agencies to engage in joint market research, advertising and international trade activities. This often also results in a reduction of costs required to meet the labelling, packaging and quality standards of countries to which they export. Accordingly, cross-border cartels are then able to trade more competitively in export markets with significantly high barriers to entry and risks. In addition, the coordination of firms' resources minimises the risks of supply disruptions (Jenny, 2012).

Similar to localised cartels, cross-border cartels harm competition and result in high prices for goods and services. Furthermore, cross-border cartels undermine economic integration across nations, decrease the benefits of liberalisation to consumers, and distort world trade (OECD, 2003). Cross-border cartels typically achieve more damaging long-run price effects, displaying greater effectiveness in raising prices compared to national cartels (Connor and Lande, 2006). Furthermore, the ability of the firms in cross-border cartels to observe international trade data (published exports, imports and customs data) increases the probability of cartel success. Consequently, the mean durability of global cartels is generally longer for cross-border cartels than for geographically limited cartels (Connor, 2011).

A common characteristic of cross-border cartels is the power to control prices on a regional or global basis (Griffin, 2001). The cartel members in such agreements meet regularly to fix prices either on a global basis, in some instances on a region-by-region basis or on a country-by-country basis. Another characteristic of cross-border cartels is the use of trade associations to facilitate cartel conduct. Trade associations had a vital role in the organization and monitoring of activities of a large number of international cartels uncovered and prosecuted by the European Commission (EC) (see Levenstein and Suslow, 2001). Moreover, many of the cross-border cartels that have been prosecuted by the US Department of Justice, made use of trade association meetings as a convincing front for their clandestine cartel meetings (Griffin, 2001). For instance, the global lysine cartel members created an amino acid working group to function as a trade association, despite the fact that the intention of the new association was to afford the colluding firms a legal reason for the cartel members to meet each other and for them to discuss their collusive arrangements (Connor, 2007). Similarly, the citric acid cartel members used an authorised industry trade association to officiate their illegal meetings. At their official meetings, the cartel members

arranged to fix the prices of citric acid and establish global market share quotas (Levenstein and Suslow, 2003). Another characteristic of cross-border cartels is that they usually comprise of firms that dominate the production facilities regionally (Connor, 2007). In addition, cross-border cartel activity is more pronounced in industries that deal in homogenous products with low transit costs (Connor, 2007).

Given an increase in the detection and prosecution of cartels with cross-border dimensions in recent years, cross-border cartel detection and enforcement is an area that has received significant attention internationally. Moreover, falling tariffs and a rising number of multilateral trade agreements and the increase in international trade have further expanded the range of products at risk of international price-fixing (Levenstein and Suslow, 2008). In order to address cross-border cartels, many competition authorities around the globe are increasing cooperation. Advanced economies have demonstrated the benefits of bilateral cooperation between competition authorities in addressing cartels with cross-border effects. The benefits of bilateral coordination include exchange of information and resource support to less equipped competition authorities to deal with complex cartels. This was demonstrated, for example, in the investigations that took place in the US, Europe, Canada, Brazil, China, Japan, South Korea, Mexico, Singapore and Australia in the automotive parts cartel. The cartel entailed collusion on prices and the rigging of bids in automotive parts among firms operating in these countries. Consequently, the automotive parts cartel resulted in significant fines across various jurisdictions (Connor, 2012), greatly aided by close corporation among the competition authorities in terms of sharing of information which was required to commence investigations in other jurisdictions.

Directly relevant to this dissertation, various cross-border cartels have also existed in the bitumen industry. In Europe, cartels in the bitumen industry were uncovered and prosecuted in the Netherlands, Spain and Belgium. In all the cases, the same firms who are multinationals were involved. All the price-fixing cases were initiated following BP Plc's simultaneous application for leniency in the different jurisdictions. In all jurisdictions, the cartel members had agreed to engage in anti-competitive conduct essentially involving: 1) price-fixing, 2) allocation of quotas, 3) volume and customer allocation, 4) exchange of sensitive information and 5) side payments to reimburse cartel members according to the market allocation agreements[3] [4]. Cartelist also monitored the

[3]Case number: COMP/38710 – Bitumen Spain
[4] Case number: COMP/38.456 – Bitumen Netherlands

implementation of market sharing arrangements and, to that effect, fixed the bitumen prices and agreed on the date on which price changes would be effective.

Given the close integration of the European markets, it was necessary for the EC to determine whether the cartels were linked by carrying out inquires for further information under a single case number. In the end, the EC contended that only the bitumen cartel in Spain had an appreciable effect upon the other European Union member states. A significant part of penetration bitumen in Spain (estimated at 20%) during the cartel period, was imported from seven[5] other European Union member countries and the bitumen suppliers also exported penetration bitumen from Spain to other member states. The areas most affected by imports were those bordering France and Portugal and those surrounding coastal bitumen depots, which stored imported bitumen for its subsequent sale. In a geographically widespread cartel case like the bitumen cartel in Spain, the EC adds to the gravity of the cartel in terms of effects, which is subsequently used to calculate damages[6] (Connor, 2007b).

As will be discussed in Chapter 4, there was an overlap in the companies prosecuted in Europe and in the bitumen cartel prosecuted in South Africa. Bitumen producers that were prosecuted in Europe including BP, Total and Shell have operations not only in South Africa but also in the SACU region. It is important to screen for evidence of cartel conduct and the possible impact of the prosecuted cartel on the SACU countries given that cartel members may find it even more profitable to get involved in numerous cartels in different jurisdictions that are in close proximity (Ivaldi, Jenny and Khimich, 2016). This is more the case if the probability of getting caught and prosecuted is small in some jurisdictions. Furthermore, if firms associated with the same company groups are present across the region, then the incentive to compete across borders and between themselves is reduced (Vilakazi, 2016). The multi-market contact between the companies in several different petroleum products presents them with additional incentive to cooperate rather than compete as they have frequent interactions, with opportunities to monitor each other's reactions in the different market. Thus, there is a basis to review the possible impact of this cartel in the neighbouring SACU countries.

There have been limited studies that have extensively evaluated cross-border cartels across the African continent. In Southern Africa, Vilakazi (2016) studied the regional cement cartel and the developments in the cement industry after the cartel was uncovered. A cartel in the cement

[5] France, Portugal, Italy, Belgium, Netherland, UK and Sweden
[6] Case number: COMP/38710 – Bitumen Spain

industry which was detected in South Africa affected all SACU member states. The three cement producers, Pretoria Portland Cement (PPC), Afrisam and Lafarge S.A who jointly owned the fourth producer - Natal Portland Cement (NPC) agreed on pricing parameters and allocated specific country markets to different producers[7]. The cartel members also admitted to allocating certain markets in the SACU region to each member as well as monitoring their arrangement by observing sales data. Other cartels with possible cross-border dimensions that have been uncovered were in scrap metal, construction, concrete pipes and culverts, pilings, steel products and industrial gases (Kaira, 2015). These cartels could have had a direct or an indirect impact on the traded products, possibly affecting at least two countries in Southern Africa, considering the significant trade between South Africa and the neighbouring countries in these industries.

Despite the close trade ties between South Africa and SACU countries, there has been little initiative to investigate these cartels originating from South Africa by the competition authorities from the region. This is in stark contrast to the Canadian competition authority's conduct. The Canadian authority has regularly followed-up on cartel cases against companies that have been probed by the US Department of Justice (Levenstein and Suslow, 2003) in neighbouring US. This has largely been on the premise of the close trade ties between the countries and the overlap of companies operating across the two countries. The lack of investigations in the SACU region after cartels are prosecuted in South Africa suggests that there is a gap in collaboration and cooperation between competition authorities in the region in this area. Therefore, conducting screens and impact assessments (similar to what is undertaken in this dissertation), on the effects of these regional arrangements and their prosecution would be an important first step in generating support for increased cooperation and allocation of resources towards detecting and prosecuting cartels.

The approach by the Canadian competition authorities reveals how information gathered from other jurisdictions can and ought to be used by other competition agencies for their domestic investigations. This does not have to involve sharing of confidential information between authorities. Investigations in neighbouring countries can used as a signal to initiate investigations in local markets in which the same firms operate in order to assess if any anti-competitive conduct was extended across borders (Khimich, Ivaldi and Jenny, 2011). This is important considering that it is possible for firms to confess to cartel involvement in one market while continuing to collude explicitly or tacitly in other markets (Nontombana and Lesofe, 2010). For example, in the

[7] Case Number: 93/CR/Nov/11

global graphite electrodes cartel, cartel conduct continued in other markets outside Europe, at least a year after the EC's commenced investigations (Levenstein and Suslow, 2003).

In order to address cross-border competition enforcement, there are regional competition regimes in Africa that are meant to deal with cross-border cartel enforcement. Due to inadequate resources and often high cost associated with investigating cross-border anti-competitive conduct for national authorities, regional competition regimes offer an opportunity for investigations at the regional level. The regional competition regimes established in Africa include the Common Market for Eastern and Southern Africa (COMESA) Competition Commission (CCC), East African Community Competition Authority, Competition Authority of the Central African Monetary and Economic Community, West Africa Economic and Monetary Union Competition Commission. While some of these regional competition authorities have made progress in merger control with a cross-border dimension, there has been very little activity on investigating cartels with cross-border dimensions. Few cases of cooperation have been publicised, although the agencies in the region are indeed cooperating. This cooperation appears to nonetheless be on a lesser scale compared to their counterparts in the developed world (Armoogum, 2018). Of the SACU member states, Swaziland is the only country that has membership in a regional competition authority, the CCC.

The next section reviews literature on screening for cartels as a tool to assess whether there is possible cross-border links in the bitumen case uncovered and prosecuted in South Africa.

2.4 Screening for cartel conduct

The most important part in a legal cartel case is proving that an agreement existed. However, getting direct evidence of a cartel agreement often proves to be difficult. Cartel operators work in secret and are often obviously reluctant to cooperate with investigators given the repercussions of prosecution. In these circumstances, economic screening can play a role in suggesting the existence of an agreement. Screening is intended to provide evidence to justify an in-depth investigation and not intended to deliver the evidence to prosecute a cartel case. Furthermore, screening can disable cartels by discovering them and making them less stable as firms adjust their behaviour to avoid being discovered.

Harrington (2006) defines screening as the process of identifying industries in which the existence of a cartel is more likely. Screening refers to a cost-effective method for identifying industries whose behaviour is sufficiently suggestive of collusion to warrant in-depth verification, that is,

deeper investigation that directly contrasts collusion and competition as competing explanations of certain market outcomes. Therefore, screening identifies suspicious behaviour that is inconsistent with competition. Screens also help authorities to estimate the duration of the infringement, by identifying the starting point and the end of any collusive arrangement (Zlatcu and Siciu, 2017). However, it does not provide conclusive evidence of collusion.

Screening for cartels is thus a proactive technique for the detection of cartels (OECD, 2015). Proactive methods entail initiatives by the competition authorities, while reactive methods are complaints filed by various stakeholders, which include competitors, customers and employees of the companies, whistle-blowers and requests for leniency. Screening may also serve as an additional incentive for companies to submit leniency applications if the cartel members believe that a screening exercise will result in cartel outcomes being exposed. Thus, active screening of cartels in the region could encourage more leniency applications and discourage firms from engaging in collusive agreements.

Economic screening uses available data, such as prices, volumes, spreads, costs, estimated market shares, trade data and any other available relevant data. Like any statistical test, the construction of an economic screen is subject to type I and type II errors. In practice, a type I error is the incorrect rejection of a competitive process in the market, while a type II error, is the incorrect failure to reject a collusive process in the market. Albuquerque and Cuibano (2015) identified properties for good economic screening to be those that minimize both type I and type II errors, which are easy to implement and those that are expensive for companies to disguise as part of their collusive behaviour. Therefore, effective implementation of cartel screens depends on the extent to which an economic screen is properly developed and applied. The quality of data is also fundamental in cartel screening. Poor quality data cannot lead to successful cartel detection activity. For this reason, access to quality data should be taken into consideration when deciding whether to undertake screening.

Harrington (2006) identified two general ways to screen for cartels: firstly, by observing the means by which the firms coordinate and secondly by observing the results of such coordination. The former entails observing structural factors and the means of coordination in a form of direct communication while the latter refers to observing the patterns of firms' prices or quantities or other aspect of market behaviour. The means by which firms coordinate can be sub-divided into structural factors, demand-related factors and supply-related factors. Screening for structural factors looks at the risk of cartelisation based on various industry characteristics that may facilitate

collusion. These include concentration in the market, high barriers to entry, frequent interaction between firms and market pricing transparency. These factors are referenced in literature in section 2.2 above. Demand-related factors that facilitate collusion include stable and predictable market growth, absence of significant demand fluctuations or business cycles, low demand elasticity, absence of buyer power and network effects. The supply-related factors that facilitate collusion include mature industries with stable technologies, symmetric costs and capacities, product homogeneity, multi market contact, structural links and other contractual agreements (Hellwig and Hüschelrath, 2017). The structural screening methodology used in this dissertation is detailed in Chapter 4.

Behavioural screening involves methods of assessing whether the patterns of prices, quantities, market decision outcomes and market shares appear to be consistent with competition or with collusion. Collusion is generally more likely when market behaviour evidence shows strong correlation in prices, low price variance over time, high levels of market transparency, high prices without associated increases in costs and stable market shares over time for individual firms (Harrington, 2006). Another key collusive marker is trends in quantities that are subject to large and persistent changes in the absence of underlying demand and cost changes. The analysis of market data can assist to differentiate a collusive environment from a competitive one. For instance, the NASDAQ collusion case was discovered based only on market data with limited non-economic evidence stemming directly from a study of pricing patterns by Christie and Schultz (1994). The study found that collusion took the form of avoiding the quoting of odd-eighths pricing of stocks so that market makers would post wider bid prices. This resulted in a minimum bid-ask spread increase of 0.25 in that market (Christie and Schultz, 1994), which therefore harmed the investors in the market to the benefit of the traders.

Evidence on pricing behaviour over time can also be analysed to understand the creation, life and break up of a cartel or likely rules under which a cartel operated (Harrington, 2006). It can further be used to date the beginning of known conspiracies, which is often difficult in practice (Crede, 2019). Price changes at the time of cartel formation or at the end of a cartel can be useful markers. At the beginning of a cartel, prices gradually increase, as a cartel experiments with the price increases that the market can bear. Likewise, at the end of cartel agreements there is usually a sudden price collapse, while during the cartel period there may be observable indications of price wars. Nevertheless, suspicious behaviour in a market detected using economic analysis does not amount to conclusive evidence, but warrants in-depth further investigations as there is a possibility that this could be consistent with competition, for example, instances where price

trends are explained by common underlying costs. Underlying factors can also include common exogenous shocks such as the increase in input prices for all suppliers, or an increase in inflation. However, suspicions that there is collusion often arise when the uniformity extends to other dimensions of the price such as those of ancillary services and discounts.

The analysis of prices can provide very useful indications as to whether a cartel is/was possibly in action (Abrantes-Metz, 2013). Although theory postulates that prices are higher during collusion in comparison with non-collusive periods, empirical and experimental economic studies provide mixed evidence on price variance behaviour. This illustrates that analysing only at the first two moments of price movements (average prices and variance) may be insufficient. The presence of a trend in prices, for example, due to underlying factors can be biased by the length of the cartel period and the length of the competitive period. Therefore, in order to accurately identify the difference in price setting behaviour independently of underlying market characteristics, it is important to compare the entire distribution of price changes over a price cycle (Von Blanckenburg, Geist and Kholodilin, 2012). This can be done by analysing the evolution of industry prices over a longer period (Motta, 2004).

Stable market shares for each industry participant over a period may be an indication of cartel activity. Stability in market shares could be a consequence of collusive arrangements to divide markets or clients. A study done by Stigler (1964) found that allocating market shares among the cartelist is presumably the best way to deal with cheating by the cartel members. Another collusive marker is low price variance. Low price variance is when the variation relating to price changes is low over time. In practice, a screen could monitor the price variance and assess whether it is low relative to some benchmark. As shown by variance screens, when a cartel is active, prices tend to be less responsive to costs and generally less variable (Abrante-Metz, Froeb, Gewenke and Taylor, 2006).

The harm imposed by cartels on society makes it imperative to put in place measures to combat their existence. To that effect, competition authorities, academics and consultants have designed a variety of economic screening tools in order to identify problems in competition. Econometric screens in particular, if designed well, can be useful tools in detecting deviations from competitive patterns, and can help to improve cartel enforcement. Moreover, they can reduce the extent of cartels' ability to secretly restrict competition. However, econometric screening like other screening methodologies only provide an indication of where the most obvious patterns occur, and further analysis may therefore be required (Blšťáková, 2016). Therefore, screens cannot

replace a more detailed understanding of the industry-specific dynamics that may explain market conduct in the absence of evidence of actual anti-competitive behaviour. Such reasons might include technology shifts, entry into the market or market exits. Furthermore, it is worth noting that screens do not differentiate between tacit and explicit collusion. Moreover, the main disadvantage of economic screens is their demand of large amounts of data of high quality and extent of the analysis, which often requires controlling for many factors. As noted by Harrington (2006), quality data are often hard to obtain and the processing of a huge amount of data is costly and time consuming.

In terms of studies using econometric methods, Bolotova, Connor and Miller (2008) used the Autoregressive Conditional Heteroscedasticity (ARCH) and Generalized Autoregressive Conditional Heteroscedasticity (GARCH) econometric models to test the hypothesis of the behaviour of the price distribution (mean and variance) during the collusive and non-collusive periods using two global cartel cases (citric acid and lysine). The study found that variance of prices during the lysine conspiracy was lower than the variance of prices during pre-cartel and post-cartel periods as expected. In contrast, the variance of prices during the citric acid conspiracy was higher relative to periods that were deemed more competitive. An advantage of using the ARCH and GARCH models is that they may use a relatively small sample of prices for a cartelized product before, during and after a hypothesised or known conspiracy (Bolotova, Connor and Miller, 2008).

The next section assesses empirical studies conducted on the impact of collusion. The studies measure overcharges which directly translate to the gain derived from collusion for the firms involved. This is important for this dissertation because it demonstrates the potential harm inflicted by cartels especially in a cross-border context.

2.5 Cartel overcharges

The most commonly used methodology to estimate damages triggered by cartels is the calculation of price overcharges. Connor (2014) defined a price overcharge as an increase in prices of products for purchasers due to an effective sellers' cartel. A price-fixing overcharge is a transfer of income or wealth from buyers to the members of the cartel that occurs due to an overt collusive agreement (Connor, 2007). According to Boyer and Kotchoni (2015), the estimation of cartel overcharges lies at the heart of antitrust policy in cartel prosecution as it constitutes a key element in the determination of fines. The price overcharge rate is calculated by comparing actual

cartel-enhanced prices to an appropriate non-collusive competitive benchmark price. The cartel price is often observed, whilst the “but-for” price needs to be estimated. The overcharge is often expressed as a percentage of the “but-for” price and this amount depends on the durability of cartel and size of the overcharge (Khumalo, Mashiane and Roberts, 2014).

General studies of cartels only involve samples which consist of uncovered and prosecuted cartels instead of the entire universe of cartels. This implies that the sample of cartels for which price overcharges can be calculated is small relative to the entire universe of cartels. Moreover, final verdicts involving a calculation of overcharges are unsurprisingly rare because almost all cartel claims settle or are dismissed before an overcharge can be calculated by a neutral observer and made public as part of the records of the case. Settlements, on the other hand, are an extremely unreliable guide on the size of overcharges of the underlying cartel cases. This is because firms often opt for settlements if the perceived claims and fines through litigation are deemed higher. Thus, the damage caused by cartels has largely been underestimated in most settlement cases (Monti, 2001).

A survey conducted by Connor (2004) found median cartel overcharges in international cartels of 30% compared to 17.2% for domestic cartels. The substantially higher overcharges in international cartels increases the importance for regional cartel detection and prosecution. Cross-border cartels appear to be more injurious than national or domestic cartels. To that effect, Connor and Lande (2008) found that cross-border collusive arrangements are capable of increasing prices by 75% more than local cartels. The much higher price increase success in cross-border cartels is because they are formed with less concern about prosecution, especially in jurisdictions that lack an effective competition authority or those with weak enforcement. Academic work on the global vitamins cartel corroborated the point on cross-border cartels thriving in countries with weak cartel enforcement. Cartel overcharges were comparatively larger in jurisdictions that did not have effective competition authorities. In addition, cross-border cartels are anticipated to have larger cartel overcharges compared to localised cartels due to feasible price discrimination (Connor and Bolotova, 2006). This is because they are able to charge different prices for the same product in different markets. Furthermore, cross-border cartels are more effective due to the greater freedom from the threat of entry by competitors compared to more geographically localised cartels, because entry into a foreign market requires a high level of scale.

Various approaches have been used to measure price overcharges and their appropriateness hinges on the economic context, availability of data and certain aspects relating specifically to the case under investigation. To calculate the level of overcharges, comparator-based methodologies are frequently used to measure the level of overcharges. These methods use cross sectional comparisons, time series comparisons or a combination of both methods - difference-in-difference methodology, (Hüschelrath, Müller and Veith, 2013). The difference-in-difference method assesses the change in price for a cartelised market over time, and compares this change against the change in price in a non-cartelized market over the same period. Methods for calculating overcharges are methods that seek to calculate the "but for prices" (counterfactual prices). The "but for" or "counterfactual price" is the price that would have been charged absent the cartel. In terms of the methodologies used to measure the "but for" price and the level overcharges are the "before and after approach", "yardstick approach", "cost-based approach" and econometric and simulation models (Boyer and Kotchoni, 2015).

The simplest and most frequently used method is the "before and after" approach which involves selecting a beginning and an end price point for the cartelised product and comparing the price changes. In the "yardstick approach", the cartelised market is compared with a similar market unaffected by the cartel. The "cost based approach" estimates overcharges by comparing the average or marginal cost-plus a reasonable mark-up with actual prices. Connor and Lande (2004) surveyed 450 studies of cartels, which contained 549 observations of "average" overcharges. They found that the most widely used method to calculate overcharges is the "before and after method". The second most popular method is econometric modelling, while the yardstick and cost-based are the least frequently employed in practice.

In practical terms, most econometric modelling techniques are an augmentation of the "before and after" methodology (Connor, 2007b). These models usually specify the demand and supply conditions in the relevant market and then investigate through statistical tests whether and to what extent changes in prices or output fail to respond to normal, competitive market forces (Connor, 2007). Results of econometric screens are often considered as most credible because these models can simultaneously incorporate a wide range of factors. However, in practice very few studies use econometric techniques to calculate overcharges due to the data intensity involved.

Although cartel overcharges are a well-studied field of competition economics, studies of cartel overcharges are few in Southern Africa. Only a few cartel overcharges have been calculated for cartels uncovered and prosecuted in South Africa. Some of the studies on cartel overcharges in

South Africa include Khumalo, Mashiane and Roberts (2014) who conducted a cartel overcharge study on the precast concrete products cartel and estimated cartel overcharges between 21% and 57% for concrete pipes in Kwa-Zulu Natal and 16.5% in Gauteng. Mncube (2014) provided an overcharge estimate by applying a "before and after" approach as well as a constant-margin method for the South African flour cartel, which was operational between 1999 and 2007 concluding that the overcharges for the white bread flour cartel were 23.7% in the Western Cape and 13.1% in Gauteng province. A study by Mondliwa and das Nair (2019) computed overcharges on the overall harm imposed by the reinforcing steel bar cartel in the South African market. They computed the average cartel overcharges to be 42.6%. The paper explored different hypotheses used to ascertain the prices that would have prevailed in a competitive environment. For this, they applied the 'difference-in-difference' approach to work out the level of the overcharge. Theron and Niekerk (2017) estimated the overcharges of the cement cartel which was extended to the SACU region to have been between 8.7% and 12.9%.

Khimich, Ivaldi and Jenny (2011) did a study calculating cartel overcharges for cartels across different sectors prosecuted in South Africa between 2000 and 2009 and found that on average, cartel-affected sales as a percentage of GDP were 3.74%. This point to significant damages on the South African market. This is more important given that South African cartels (which may have an appreciable impact on the region) often exhibit relative stability. Two of the most stable cartels, the De Beers diamond cartel and the South African cement cartel, had their origins in South Africa and extended to other regions (Levenstein and Suslow, 2006). The close trade ties with SACU member states therefore make it worthwhile to investigate the possible impact of cartels uncovered and prosecuted in South Africa on the SACU member states. Collectively all overcharges studies on cartels which were uncovered in South Africa concluded that these cartels often exhibit high cartel overcharges similar and in certain instances greater than those of conducted in developed markets of the US and Europe.

Quantifying the impact of cartels with cross-border dimensions is challenging task in practice due to the unavailability of uniform pricing data across the markets. To this end, trade data is often used in the place of actual prices. Levenstein, Suslow and Oswald (2003) used the trade data to compute the probable impact of international cartels on developing countries' trade balances, consumers and producers. This analysis covered three cross-border cartels with cartel members from developed countries, which had an appreciable impact on developing countries' economies. This entailed the mapping and quantifying the total amount of trade which was affected by the price-fixing conduct. Using trade data, the magnitude of the impact of the cartel was measured

by calculating the total "cartel affected" imports as a percentage of total imports and GDP for each affected country. They found that the cartel had a substantial impact on developing countries imports. This study will also use similar methodology to compute the potential impact of the South African bitumen cartel on the SACU region. The methodology is discussed further in Chapter 3.

Of particular relevance to this dissertation, Boshoff (2015) did a study of the price overcharge on the bitumen cartel in South Africa, taking into account the cartel's transition from being a legal to an illegal cartel. The study compared different econometric methodologies to compute overcharges, while accounting for the fact that the cartel was previously a legally sanctioned cartel. As an initial starting point, the study undertook the temporal methodology to calculate overcharges. This methodology compares market outcomes (prices and output) for the duration of the collusion with a competitive benchmark period. Second, the study considered a spatial approach, which compared market outcomes during the collusive period with those of a similar market in another geographical location that was not affected by the collusion. In this instance, comparisons were made to the bitumen markets in New Zealand and the US. To that end, the study found significant overcharges by the bitumen cartel uncovered in South Africa, of 18% to 20% (Boshoff, 2015).To the extent that significant overcharges were found in the domestic market, it is also possible that similar overcharges also affected the other markets in the region**.**

The above discussed studies nonetheless probably understate the cartel overcharges calculations. This is because these calculations may not take into account the full duration of the cartel as this is usually estimated based on assumptions and available data. The duration of prosecuted cartels is usually obtained from publicly available case documents that detail the period which the cartel was active. In certain instances, however, the exact commencement of a collusive agreement may be a period earlier than the period stated in case documents (Evenett, Levenstein and Suslow, 2001). Furthermore, overcharges may possibly be biased upwards when using the "before and after" approach. This is because prices often remain at higher levels (above the "would-have-been" competitive levels) after a cartel has been uncovered and prosecuted. Post-cartel prices do not automatically adjust downwards. Therefore, the margin of error in the estimation of overcharges is higher for cartels that endured for longer periods (Harrington, 2004). In addition, the process of computing overcharges is also complicated by the complexity of estimating the "counterfactual price", often because cartels impact more than the price variable. They also impact new business entry, and the rate of technological change, which also consecutively impacts on the pricing (Levenstein and Suslow, 2012).

2.6 Chapter summary

This Chapter gives an overview of the theory of cartels and cartels with cross-border dimensions. Economic literature evidences cartels to be the most damaging of all competition contraventions as they cause significant harm to consumers. Cartels set prices at levels above competitive price levels to the harm of consumers and competition in the market. Therefore, jurisdictions around the world have adopted a strong interventionist approach towards cartels. The detection and deterrence of collusive conduct therefore remains central to the strategy of any competition authority. This is even more important for cross-border cartels as there is evidence from literature that these type of cartels are more effective at raising prices and are found to be relatively more stable, compared to cartels that are restricted within national borders.

The literature review likewise shows that screening for possible cartel conduct by companies that have been uncovered and prosecuted in other jurisdictions is important. Screening enables competition authorities to detect and possibly assess the potential impact, if any, on their respective countries. The review further considered the calculation of cartel overcharges of cross-border cartels and found that these result in relatively higher cartel overcharges, on average, compared to more geographically localised or national cartels. The study also presented the significant overcharges of the South African bitumen cartel calculated in a previous study by Boshoff (2015), which is the subject product market in this dissertation.

CHAPTER 3: RESEARCH METHODOLOGY

The research uses both primary and secondary data derived from multiple sources to answer the research questions. First, a qualitative assessment is undertaken from responses of interviews conducted with the bitumen industry stakeholders on the bitumen landscape and the degree of competition within the SACU region. This is on the premise that a more comprehensive picture of activities of cross-border cartels and their effects on both consumers and competitors can be derived from a qualitative discussion (Levenstein and Suslow, 2003). Information for the qualitative assessments is also derived from the implicated companies' websites, SABITA published documents, newspaper articles and settlement agreement documents from the case. Overall, the responses from the interviews and qualitative data from the other sources were used to undertake behavioural and structural screening for collusive activity within the bitumen industry, guided by the literature. Second, trade data was used to analyse the dependency of the SACU region member states to South African bitumen exports as well as to analyse pricing trends

derived from import trade data. The study also calculates the possible impact of the bitumen cartel on the SACU region.

The study chose the SACU countries for the analysis due to their close proximity to the South African market. Moreover, the countries belong to the same customs union with their respective local currencies pegged (one to one) to the South African Rand. Consideration was also taken for countries that are dependent on the bitumen imports from South Africa as these warrant further investigations for cartel activity on the basis of a cartel that was uncovered and prosecuted in South Africa. This is as the cartel may have had an appreciable impact on their domestic economies.

A semi-structured questionnaire was used for the interviews. Guided by the literature review, specific research questions were asked on the market and structure of the bitumen industry in the SACU region. The questionnaire also asked questions on bitumen pricing behaviour in the SACU region as well as the main drivers of bitumen pricing in the region. The questionnaire used in the research is provided in the annexure 3 and the results are discussed in Chapter 4. For the qualitative research, the research ethics were dealt with by obtaining ethical clearance from the University of Johannesburg, dated 20 May 2019. The ethical clearance is also attached in annexure 2.

Open-ended semi-structured questions were decided upon to allow more freedom of interaction with the key experts around the questions posed. However, the open-ended semi-structured questionnaire approach also has a major drawback. They required time for the interviews to be setup, for the interviews to be conducted, for the results of the interview to be transcribed and for the transcriptions to be analysed and written up in a report.

The population of stakeholders in the bitumen industry is limited considering the small number of bitumen producers in the region. The questionnaire was addressed to senior managers of the bitumen producers who are well positioned to provide insights in terms of governance, operations and market structure.

SABITA, the industry association was targeted for the unique position it occupies in the bitumen industry. All the main bitumen producers as well as most final users of bitumen (road construction companies) are members of the industry association. The initial interview was used to source referrals (for names of other industry experts) to explore the relationship along the value chain.

Nine[8] senior managers and specialists at the bitumen producing companies were then contacted, but most refused to participate in the questionnaire, citing issues of confidentiality and contractual restrictions on discussing issues relating to pricing and price-fixing. Moreover, those that were personally involved in bitumen case that was prosecuted in South Africa are contractually bound not to discuss issues relating to the case or the general price generation mechanism. The major obstacle encountered in securing more interviews was therefore due to concerns around privilege and confidentiality. In total, four responses were received out of the nine entities approached. While the absolute number of responses is low, there is value to be drawn from the responses received. To supplement for the low response rate, the qualitative section was augmented by other research sources mentioned above.

Table 1 below sets out the organisations and designations of persons interviewed. The names of the interviewees are withheld at the request of the respondents given the sensitivity of the research topic. In the case of the interviewees from the oil companies, even the name of the actual companies is withheld because there only are a handful bitumen producers in the region hence they can be easily identifiable.

Table 1: List of interviews

Name	Organisation	Position	Date interviewed
Interviewee 1	SABITA	Senior manager	05/08/2019
Interviewee 2	Bitumen producer (Major oil company)	Bitumen specialist	29/09/2019
Interviewee 3	Bitumen suppliers and services (BTSS)	Senior manager	03/10/2019
Interviewee 4	Bitumen (Major oil company)	Senior manager: Bitumen division	13/06/2020

Source: Interviews, 2019, 2020

Second, quantitative data was collected from a number of databases. The data sources and variables employed in the quantitative analysis are summarised in Table 2. The data was collected for the period 2000 to 2015. The cartel duration is estimated to have been from 2000 to 2009. The analysis is done until 2015 to observe changes post prosecution of the cartel and to make some inferences about the potential trends after the cartel was uncovered. The data sources include UN Comtrade data, IMF database, and Statistics South Africa (StatsSA) and

[8]SABITA, Engen, South African Bitumen Professionals, Colas Namibia, Colas South Africa, Shell, Total, BP, Sasol.

SABITA reports. There are missing values for some years in the database, particularly those for Lesotho and for that reason, it is dropped from some of the analysis.

The table below illustrates the data collected.

Table 2: Data collected

Data variable	SACU countries bitumen import data	SA Bitumen PPI index	Brent crude oil price	Bitumen trade volumes	Annual GDP data
Source	UN Comtrade data	Statistics South Africa	IMF	SABITA	IMF
Unit	USD/kg	Index points	USD/ barrel	Tonnes	USD millions
Data range	2000 - 2015	2000 - 2015	2000 - 2015	2000 - 2015	2000 - 2015

Bitumen transaction prices are privately negotiated between the buyers and the sellers and are not publicly available. This dissertation therefore uses the bitumen producer price index, published as part of the producer price index (PPI) reported by StatsSA as a proxy for the South African prices. The bitumen producer price index has, in previous studies of this market, been deemed a fair representative of the price series. Boshoff (2015) found that bitumen PPI trends were in line with list prices of bitumen from the different bitumen producers.

In general, there are enormous difficulties in undertaking quantitative assessment of cartels due the secrecy under which cartels operate. Across the SACU countries, there is a clear gap in terms of data on bitumen pricing which is available in a consistent format. This makes it difficult to assess price parallelism and price movements in different countries. For this reason, the study turns to trade data as a way to analyse and quantify, albeit roughly, the impact the South African bitumen cartel had on the SACU member countries. Absent domestic bitumen prices for the SACU countries, this study relies on trends in import price data (which are a proxy for domestic prices). The import price data is estimated by dividing USD values of the imported bitumen by the corresponding volume in kilograms (kgs). The main advantage of the use of this formula to estimate the import prices is that it is simple and intuitive and does not require extensive data to be implemented. While the weakness is that, the price is still not the direct price of bitumen in the respective markets. As discussed in Chapter 4, bitumen in the other SACU countries is primarily imported from South Africa from the main oil companies implicated in the cartel conduct.

Although there may be an additional mark-up or discounts when on-sold to customers in the respective countries, the import price can provide an indication of trends in list prices in the SACU countries. In this dissertation, import prices are therefore used as a proxy for domestic prices in the region on the basis that the domestic prices and import prices have the same underlying drivers.

Annual bitumen import values (denominated in US dollars) and weight of bitumen in kilograms from 2000 – 2015 was sourced from the UN Comtrade database. The HS codes for the data used in the study is 271320 - Penetration Bitumen, imports by the Botswana, Lesotho and eSwatini from South Africa. This data was used to calculate bitumen import prices for the SACU countries. However, it is important to note that there are missing values from the dataset and that some data on weights and prices appear to be inaccurate. In line with the procedure by (Boshoff, 2015) import data of less than 100 kilograms was discarded from the analysis data, as low recorded import weights could be an indication of measurement errors. Boshoff (2015) calculated the bitumen import prices for 226 countries from 1990 to 2011. Import price were used to demonstrate the evolution of bitumen import prices in comparison to the South African prices. The study found that the South African prices exceed average prices over most of the sample period. For this dissertation, the calculated import prices are converted to price indices and an analysis of the import pricing trend is done, taking into account the collusive markers as suggested in the literature (Harrington, 2006).

The relative import prices in the rest of the SACU countries, South African domestic bitumen prices and international crude oil prices are plotted together to observe trends in the prices. In addition, a simple correlation matrix between the South African domestic bitumen prices and the relative import prices is computed. An analysis of the computations is presented in Chapter 4.

To assess the potential impact of the cartel, methodology similar to what is used in Levenstein, Suslow and Oswald (2003) is employed. They computed the probable impact of international cartels on developing countries' trade balances, consumers and producers. The Levenstein, Suslow and Oswald (2003) analysis covered three cross-border cartels with cartel members from developed countries, which had an appreciable impact on developing countries' economies. This entailed the mapping and quantifying the total amount of trade which was affected by the price-fixing conduct. Using trade data, the magnitude of the impact of the cartel was measured by calculating the total "cartel affected" imports as a percentage of total imports and GDP for each

affected country. They found that the cartel had a substantial impact on developing countries imports.

Similarly, this study uses the trade flow data to show that the impact of the bitumen cartel uncovered and prosecuted in South Africa is likely to have been substantial. This methodology relies on the fundamental, and fair, assumption that the cartel pricing formula was possibly applied to the exports market (that is, the cartel price is reflected in the import price in the SACU countries). There is no indication that a different pricing for SACU countries was utilised. However, it is important to note that a limitation of this methodology is that the "cartel affected" import price does not control for other factors which impact prices in the local markets.

Estimating the impact of cross-border cartels is a complex task due to other immeasurable factors that may impact prices. In line with the methodology used by Yu (2003), the imports of a cartelised good are used as proxy for cartel-affected transactions, this is then used to calculate the cartel overcharges. In this dissertation, the impact of the bitumen cartel uncovered and prosecuted in South Africa to the SACU member countries is approximated by multiplying the estimated overcharge as calculated by Boshoff (2015) with the total "cartelised" goods imported. The overcharge is therefore calculated as "imports multiplied by the potential price overcharge. Boshoff (2015) estimated cartel overcharges from the bitumen cartel of between 18% and 20% in South Africa.

Limitations

The main limitation of the methodology is the unavailability of the effective or final (after discounts) bitumen prices for the SACU countries. There is therefore a gap in terms of data availability in a consistent form across countries for assessment of price parallelism and price movement across the countries. This also affects the calculation of the true impact of the cartel if it was extended to the region.

Historic bitumen prices internationally would have further provided another benchmark for comparison between SACU countries and other countries globally. This could provide an indication of whether prices in the region were higher than other comparable countries globally during the cartel period and could be used as another measure to calculate overcharges. However, such data is not publicly available and the costs of obtaining the data from private data collection companies is prohibitively high.

CHAPTER 4 ANALYSIS: REGIONAL IMPACTS OF THE BITUMEN CARTEL

4.1 Introduction

In this Chapter, the analysis of the possible regional impacts of the bitumen cartel that was uncovered and prosecuted in South Africa is undertaken. First, the value chain of the bitumen industry in the SACU region is mapped. Second, a brief introduction and background to the South Africa bitumen case is provided. The Chapter then undertakes a qualitative assessment of the competition dynamics in bitumen industry within the SACU region. Lastly, a quantitative assessment using trade data of the potential impact of the South African bitumen cartel case on the regional SACU markets is presented.

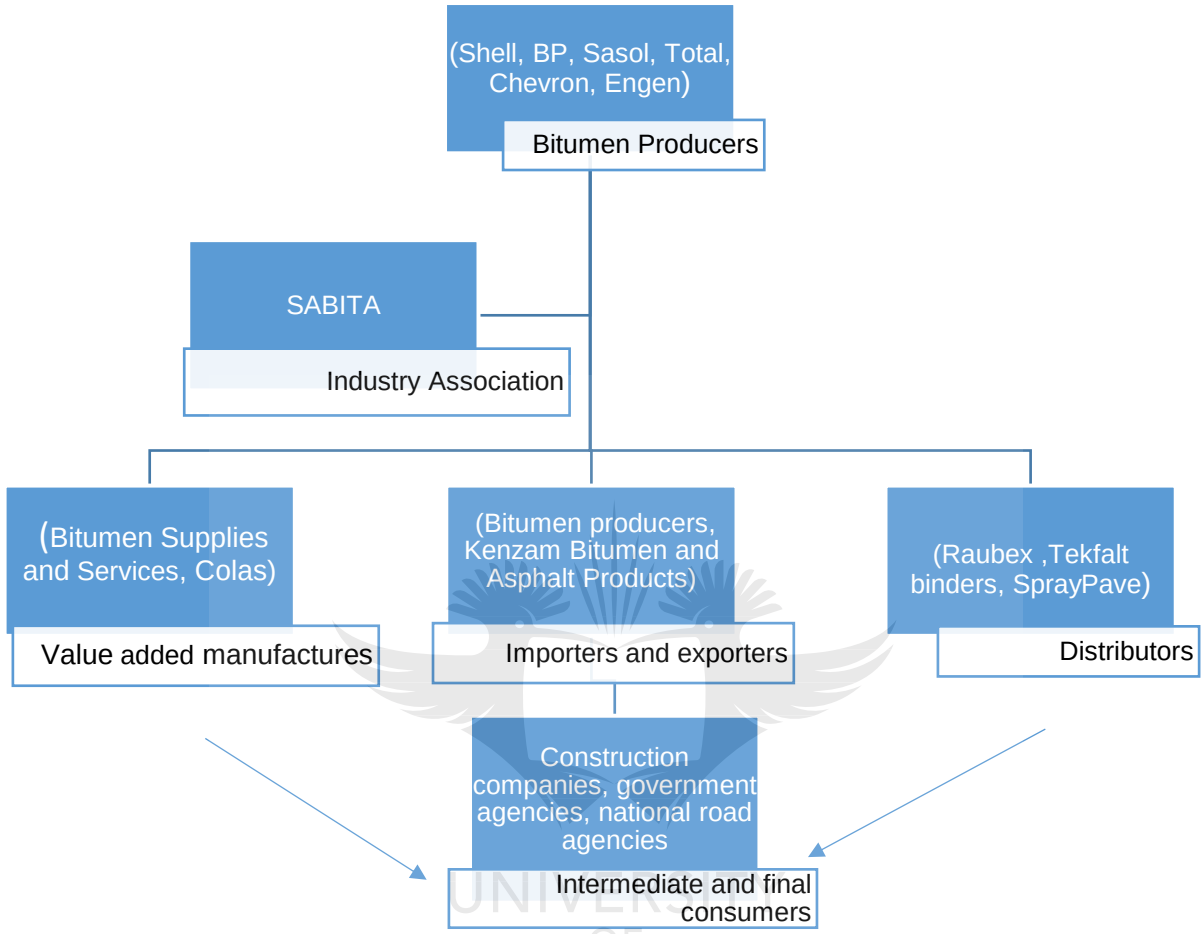
The analysis in this Chapter seeks to answer the question about whether the behaviour of the dynamics in the bitumen industry in the other SACU countries are consistent with competition or collusion. This kind of analysis seeks to check if a collusive model fits the data better than a competitive model. To do this the bitumen value chain in the SACU region is mapped in the next section below.

4.2 Bitumen value chain in the SACU region

Bitumen is produced, as a by-product in the process of oil production. The rest used in industrial applications (Bester, 2014). The production of bitumen takes place in the course of distillation of oil. There are different bitumen types, produced from different fuel production processes. Final bitumen is predominantly used in the manufacture of asphalt (used for road construction and maintenance). Bitumen is produced in various grades; the grade that is the subject of this study is penetration grade.

Bitumen is vital in road construction process, and therefore critical in the development of road infrastructure in the SACU region. Hence, the price of bitumen and its supply has a wider impact for investment into road construction. As a primary road construction intermediate product, bitumen prices are a direct cost into construction of roads (Bester, 2014). Access to cheaper inputs into road construction relies largely on the competitive environment prevailing between market participants. This can be distorted significantly if there are disruptions in the competitive process. Figure 1 below maps the value chain of the bitumen industry in the SACU region countries.

Figure 1: The bitumen value chain in the SACU region



Source: Author's construction

The bitumen industry in the SACU region consists of key stakeholders which include oil refining companies (bitumen producers), bitumen value added manufacturers, traders, importers and exporters, distributors, immediate consumers (primary road construction firms) and final consumers of bitumen and the regional industry association, SABITA. The oil companies are vertically integrated along the petroleum value chain with presence at wholesale and retail levels. Bitumen is produced in four refineries in South Africa. These are Natref (operated by Sasol and Total), Sapref (operated by BP and Shell), Enref (operated by Engen) and Calref (operated by Chevron) (Boshoff, 2015).

The coastal refineries Enref and Sapref produce bitumen perpetually as a by-product of fuel refining, while Natref refinery produces bitumen by switching to a bitumen production process. Therefore, coastal refineries are designed to continuously produce bitumen as a filtrate. As a

result of the production configuration of the coastal refineries, they tend to account for the bulk of bitumen production and exports in South Africa. Consequently, more than 60% of bitumen production capacity is shared by Enref and Sapref refineries in Durban (SABITA, 2007).

South African bitumen producers have substantial operations and presence in the SACU markets. In terms of bitumen traders, there are only a few main traders that are vertically integrated with construction firms that operate in more than one country. In most cases, these companies (traders and construction firms) are South African. Various South African construction firms have operations in the region, which are important for these firms' financial sustainability (SABITA, 2007).These construction companies typically purchase bitumen in South Africa and use it in the region. Due the small domestic markets in the SACU countries, there tends to be close coordination between these bitumen producers in their day-to-day operations. This close coordination reduces the incentives for competition among the companies as explained in Chapter 2. For example, in Namibia, due to the relatively small market for petroleum products, companies share import shipments and facilities for storage. This is done to reduce costs and maximize benefits (Bank of Namibia Quarterly Bulletin, 2003), but it also means that there is greater private information being shared about import volumes as part of the operations of the shared infrastructure. This can facilitate collusion as discussed in Section 4.4.2 below.

4.3 Background to the South African bitumen cartel case

The bitumen cartel was a legal, state-sanctioned, cartel in South Africa until 2000. However, after market liberalisation, the legal cartel was disbanded. The cartel comprised of oil companies namely, Total, Engen, Shell, Sasol, Tosas, Masana Petroleum Solutions, Chevron and the industry association SABITA, in which all the companies were members. The bitumen producers who were competitors in a horizontal relationship in the production of bitumen, continued to engage in practices emanating from the legal cartel era which post market liberalisation were now in contravention of section 4(1)(b) of the South Africa Competition Act no. 98 of 1998 as amended. These practices included price-fixing through sharing of price sensitive information through the industry body (SABITA).

During the exemption period from 1986 until 2000, the oil firms collectively determined the price of bitumen by using a pricelist, the Wholesale List Selling Price (WLSP). This price had the approval of the government and was not subjected to price-fixing restrictions. The WLSP for bitumen was made up of the 'In Bond Landed costs' (IBLC), which essentially was an import parity formula where

various transport related costs were added to a Free on Board heavy fuel oil price (linked to the international crude oil prices) at typical international refining centres (Boshoff, 2015). The final WLSP price also included the SABITA levy, profit margin and the road equalisation factor. Information on the WLSP was exchanged through regular email communication between the oil companies, informing them of the Rand per tonne escalation figures for each month. A 'Bitumen Price Adjustment Factor' (BPAF) was used to adjust the present month's WLSP to calculate the next month's WLSP. It was therefore forward-looking and provided an indication of the pricing direction of list prices for the next month (Boshoff, 2015).

After the lapse of the exemption period, it was envisioned that oil companies would set prices independently. Contrary to this, the bitumen producers approached SABITA to develop a pricing formula to replace the WLSP. Consistent with the recidivist nature of cartelists (Connor, 2007) and peculiar features of the bitumen market that include well-known pricing points (in this case the WLSP that was used during the exemption period) this provided an environment more conducive for the oil companies to continue with the collusive behaviour. Information exchange continued among the market participants, through the industry association (SABITA) in the interest of continuing to calculate a reference price at the request of government and industry for price stability and transparency. This marked the beginning of the illegal bitumen cartel which is estimated to have commenced in September 2000 and presumably ended in December 2009 after the Competition Commission commenced investigations. The investigations were triggered by Sasol and its subsidiary, Tosas's[9] request for immunity under the Corporate Leniency Policy. The bitumen producers jointly established the pricing formula, which was a reference price and price adjustment system for each month. In their defence the oil companies (bitumen producers) argued that due to the nature of the bitumen industry, the consumers of bitumen desired fixed and a more transparent pricing mechanism for effective adjustment of bitumen prices.

The cartel members approached the industry association to calculate the bitumen reference price that was to be used as a referral point to determine actual prices. It was also used as a point of reference for price escalation from month to month. Therefore, the bitumen producers agreed on a reference price from which actual transaction prices could then be negotiated. SABITA calculated the BPAF used to compute monthly transaction prices as follows:

$$BPI_t = BPI_{t-1} * BPAF = BPI_{t-1}[f * \frac{HFO_t}{HFO_{t-1}} \quad t\,(1-f) * \frac{PPI_t}{PPI_{t-1}}]$$

[9] During the cartel period Tosas was a joint venture company owned by Total and Sasol

Source: Adapted from Boshoff (2015)

Where: BPI is the bitumen price index, BPI_{t-1} is the bitumen price index for the previous month, BPAF is the price adjustment factor, HFO is the heavy fuel oil, which is the price used to approximate for bitumen prices, PPI is the producer price index and f is the adjustment factor.

The outcome of the formula above was termed "the bitumen price index" which was used to adjust the bitumen prices throughout a contract period to accurately reflect price fluctuations caused by foreign exchange variations, fluctuations in the crude oil prices and domestic influences such as the inflation. The bitumen price index was published monthly, enabling contract prices to be adjusted at a minimum on a monthly basis. SABITA published the monthly bitumen price index.

While the final price to the end bitumen consumers could have included a degree of competitive discounting, the fact that the reference price was determined in a collusive manner still amounted to price-fixing. The bitumen producers' conduct resulted in the final customers being charged prices that were not competitively determined. To this end, the CCSA argued that the conduct of the bitumen producers harmed the final consumers. Therefore, if the same pricing mechanism was used in the SACU region for the bitumen export sales this would amount to price-fixing in the region. It is important to note that there was no indication that a different pricing formula was used in the SACU region or even in the broader Southern African region, including from the interviews conducted.

The Competition Commission alleged that the oil companies engaged in price-fixing in contravention of section 4(1)(b)(i) of the South African Competition Act which prohibits price-fixing agreements and concerted practices by firms. The Commission also found that the six oil companies, which were producers and suppliers of bitumen, sustained the price-fixing arrangements by exchanging sensitive price information through the industry association SABITA.

The case was concluded through settlement agreements with the oil companies and the industry association for price-fixing activities between the years 2000 and 2009. The publicly available settlement amounts are presented in Annexure 1. In addition to the payment of fines, the companies agreed that they would discontinue the exchange of information regarding prices, pricing methods or other terms and conditions of sale in the future.

4.4 Qualitative assessment of competition in the SACU region

4.4.1 Structural characteristics that facilitate collusion

This study made use of qualitative assessments to deliberate the competition landscape in the SACU region. The information was largely derived from interviews conducted with the bitumen stakeholders as well as from other research sources as noted in the methodology Chapter.

The general structural characteristics that facilitate collusion are set out in the literature review in Section 2.2. These include concentration of companies trading in homogenous products, high barriers to entry, stable demand conditions, a history of a legal collusion, high ratio of fixed to variable costs, price transparency and symmetry among firms, multi market contact between firms, existence of a trade association and cross ownership among firms (Church and Ware, 2000). A detailed discussion of these factors will be presented below as they relate to the bitumen collusion case.

Predictably, the respondents generally noted that there was sufficient competition in the bitumen industry within the SACU region during the cartel period. Their response was based on what they explained as 'aggressive pricing' in the market and the pricing outcome being a process of negotiation. With the quality being graded according to industry specifications, the main parameter for competition is pricing (Interviews, 2019). Competition is noted to be mainly on pricing (lower pricing and higher discounts) and security of supply (that is, sustained long term supply). The bitumen specialist also detailed that discounts on transaction prices are negotiated with individual customers and are confidential. However, a closer assessment into the structural characteristics of the bitumen industry in the SACU region points to an industry conducive for a regional cartel. Most structural features of the bitumen industry facilitate collusion.

It was noted that it is more economical for the SACU member states to import bitumen from South Africa due to the shorter distances between the countries. Therefore, it is impractical from a logistics perspective for land-locked SACU countries (Botswana, Lesotho and eSwatini) to import bitumen from alternative sources, although there are small imports from other sources. Bitumen needs to be transported and delivered in hot liquid form because a minimum temperature is required for the production of asphalt, where it serves as an adhesive binding other materials together. Due to the short distance between markets, bitumen from South Africa is moved in hot tankers as opposed to importing from other destinations where it would have to be imported cold and will need to be heated on arrival. The heating on arrival attracts additional costs. This means

that bitumen could be imported to the SACU markets from other markets at higher prices. Another dynamic is that most Middle East and Chinese suppliers (who provide an alternative to South African imports) insist on minimum import quantities of (at least 500 tonnes) being imported, while this is not case with South African suppliers of bitumen (Interviews, 2019). Small quantities of bitumen from South Africa can be supplied in drums or containers to accommodate smaller bitumen orders.

There are limited volume usages of bitumen in Botswana, Lesotho, eSwatini and Namibia given the small market sizes of their economies. Bitumen consumption in these markets is low relative to global volumes, hence the absence of bitumen plants in these markets. Consequently, local demand is mainly satisfied by imports from South Africa. In the SACU region, bitumen production facilities are only located in South Africa. The four refineries as set out in Section 4.2 account for all the bitumen production in the SACU region (Bester, 2014), with the exception of some bitumen imports into Botswana and Lesotho that were not from South Africa. This is discussed in Section 4.5.2. Effectively, bitumen production is concentrated in SACU region to the six oil companies that control the refineries. Therefore, for the duration of the cartel period, these companies accounted for all bitumen production used for road construction and maintenance in the region.

The findings in Connor (2007) that cross-border cartels predominantly involve firms that have a controlling market share in the countries where they operated, is a structural feature which increases the possibility that the South African bitumen cartel could have been extended to the SACU region because the bitumen producers in the region controlled all bitumen production. In the wider Sub-Saharan Africa region as whole, bitumen production capacity is limited. Apart from those in South Africa, the other bitumen refineries are located in Zambia and Kenya. However, these refineries are often described as erratic and the quality is sometimes questionable (SABITA, 2007). This implies that there is high concentration in the industry at production level and no significant competition for the South African bitumen producing refineries. Moreover, concentrated markets are more predisposed to result in cartelisation. A small number of firms lowers coordination costs and makes organisation of secret meetings easier. Concentrated markets may also imply that the leading firms have a larger market share and may have similar cost structures and market shares. This makes it easier for members to monitor each other in terms of adherence to the rules of the cartel. The companies were all members of the region trade association SABITA, which was also implicated in the cartel that was uncovered and prosecuted in South Africa. Moreover, these oil companies interact in more than one market, as they are

vertically integrated from refinery level to wholesale marketing and retail distribution networks. Another factor is that all the companies have extensive operations in the SACU region.

The absence of significant competition in the region for the South African bitumen exports points toward market power by the South African bitumen producers in the region. Moreover, there are opportunities for the bitumen producers to exercise this market power through cartel activities when faced with weak competition (Martyniszyn, 2012).

Having established that the South Africa bitumen producers face limited competition in the region and with bitumen being a relatively homogeneous product, price is the crucial variable for competition. This is as the number of parameters that companies have to deliberate to accomplish a collusive agreement are reduced. It is also important to mention that homogeneous products generally facilitate collusion (Church and Ware, 2000). Together with the lack of substitutes for bitumen, this points to a lack of competition for the bitumen producing companies. This in turn fosters a conducive environment for a cartel to flourish within the region. The literature review illustrated that cross-border cartels tend to be in industries that are concentrated, trading in homogenous products (Connor, 2007). The oil companies that control the bitumen refineries in the SACU region have significant operations and presence across the region. Moreover, they have operations across different product markets as discussed in Section 4.2. The frequent multi-market interactions in the different product and geographical markets, increases the likelihood of successfully colluding in the market. This is because the greater the multi-market contacts, the more times and places the firms interact increases the number of opportunities for monitoring and punishing of any deviation from the collusive agreement, therefore increasing the likelihood of successful collusion. Furthermore, the industry structure and customary practices make the bitumen industry a fertile ground for price-fixing. This is evidenced by cartel cases in the bitumen industry in other countries, such as those uncovered and prosecuted in Spain, Belgium and the Netherlands, which featured the same oil companies as discussed in the literature review (Chapter 2).

As highlighted in the literature review, a common characteristic of cross-border cartels is the power to control prices at a regional or global basis (Griffin, 2001). The possession of market power by the bitumen producers and the potential to exercise this market power makes it plausible that the pricing mechanism used in South Africa could have been extended to the region. As postulated by Griffin (2001), membership of a trade association can also facilitate cross-border cartel activity. The majority of cross-border cartels prosecuted and investigated by the US's

Antitrust Division endured due to a trade association (Connor, 2007). The members of the South African bitumen cartel were all members of the trade association, SABITA. SABITA facilitated the price-fixing in the South African market as it was used as a platform to calculate the reference price which in turn was used to adjust prices on a monthly basis. While it is common practice for bitumen prices to be collected and published, this function is customarily done by an independent public entity in other countries (Boshoff, 2015). In the South African case, however, this was done by a private entity, SABITA, whose members were the major oil companies. As such, this exchange of information facilitated the price-fixing between the parties. This is discussed in the literature review in Chapter 2 and evaluated in the section on behavioural factors facilitating collusion in Section 4.4.2. Information exchange is even more damaging when companies share pricing data which is forward looking. In the bitumen cartel case the producers shared information on prices which were forward looking (the reference price was used for a new month). Given that SABITA is a regional association, it is plausible that the agreements could have extended to the whole SACU region.

After having established the structural characteristics in the bitumen industry which facilitate collusion, high barriers to new entry would then be an important consideration to any cartel agreement. High barriers to entry could facilitate collusion within the SACU region in the bitumen industry. The SACU region is characterised with high barriers to entry due to large investments required to establish a bitumen plant. Bitumen production has considerable barriers to entry due to the importance of scale economies and the substantial capital investment required in setting up bitumen plants. The major oil companies who control bitumen production face no credible threat of entry or expansion by other competitors which implies that there is a benefit of continued tacit collusion. For the duration of the cartel, the industry was relatively stable with entry and exit only occurring after the cartel presumably ended. Bitumen production was concentrated to the four South African refineries controlled by the six oil companies prosecuted for price-fixing. There is no evidence suggesting that the bitumen producers blocked entry or potential entry into bitumen production, therefore in this case entry was limited by the structural features of the industry (high capital requirements and the importance of technical and market knowledge). Post cartel, Tosas which was jointly owned by Sasol and Total was acquired by the Raubex Group (a road construction and rehabilitation company)[10] in 2013. This shows that even post- cartel prosecution

[10] https://www.iol.co.za/business-report/companies/tosas-buyout-puts-raubex-on-the-road-to-self-sufficiency-1500729

the market structure did not change considerably as acquisition of Tosas by Raubex did not change bitumen productive capacity in the region. The history of cartelisation dating back to the legal cartel era also facilitates collusion in the region as the market participants are used to cooperating than competing. In the case of the bitumen cartel the cartelist were used to jointly determining the prices using a predetermined formula. The well-known focal pricing points among the cartel participants increases the risk of recidivism. The history cartelisation conducive to facilitating collusion as set out in the literature review (Church and Ware, 2000).

Certain market aspects of the bitumen industry make it susceptible to market allocation and coordination at a regional level. The geographical location of the SACU countries could facilitate market sharing. SACU countries are in close proximity, eliminating the transport distances and costs between the countries. As noted in the paragraphs above, shorter transport distances present South African exports with relative pricing advantages compared to other countries which are further from the SACU markets. Moreover, the fact that the countries belong to the same customs union, means that a common tariff (which is relatively less than those that apply to trade with other markets) apply. This also adds to the attractiveness of the South African bitumen exports. Cartels become stable as trade barriers are reduced. The fundamental reasoning behind this perspective is that reduced trade barriers also reduce the costs of punishment and hence make the severity of punishment – when breaking the collusive agreement harsher. Lower trade barriers, while beneficial for regional trade and economic development, can also make it easier for cross-border cartels to maintain collusive outcomes in the region. Therefore, with reduced trade barriers, it is more important to ensure that measures are in place to ensure that anticompetitive behaviour does not spill over across borders.

4.4.2 Behavioural factors facilitating collusion in the SACU bitumen industry

The bitumen cartel uncovered and prosecuted in South Africa was mainly on the premise of the predetermination of bitumen list prices based on well-known pricing and formulae. The jointly calculated reference price acted as a focal price point. In light of the fact that few large companies hold the largest share in the regional market and that they have frequent interaction through the regional trade association gives rise to the possibility that the oil companies may have extended the collusive agreement region-wide. While the sharing of information and the joint determination of the price by the oil companies ceased post-cartel, key conditions that facilitate collusion such as (well-known focal pricing points) and continued membership in the trade association SABITA are still present in the industry.

Information exchanges among competitors increases transparency in the market, which can lead to efficiency enhancing benefits but may also present competition risks (Abrantes –Metz, 2013). Information exchange on prices between horizontal competitors is prohibited under most competition laws as this aids collusive agreements. The artificial removal of the uncertainty about competitors' actions, which is the very foundation of the competitive process, by itself, eliminates the normal competitive rivalry. Moreover, information exchange is more likely to restrict competition where markets are concentrated, feature high barriers to entry, are non-complex, stable and have symmetric cost structures (Levenstein, Sivadasan and Suslow, 2011). The bitumen cartel case uncovered and prosecuted in South Africa entailed information exchange on a reference price for bitumen and bituminous products. This information exchange restricted competition by facilitating a common understanding on prices between competitors. According to the Competition Commission of South Africa information exchange guidelines[11], information exchange of this nature carries the greatest risk. In case of bitumen, the history of collusion in the sector created well-understood pricing points that allowed for coordination of behaviour which has potential to continue in the market. Therefore, to the extent that the information on prices was exchanged in the SACU region, competition was undermined in the region.

4.4.3 Summary of the structural and behavioural characteristics in the SACU region

In conclusion, the Table 3 summarises the structural and behavioural factors discussed above that facilitate collusion in the bitumen industry within the SACU region.

Table 3: Economic conditions facilitating collusion in bitumen industry within the SACU region

Structural and behavioural factors facilitating collusion	**Factors in the SACU bitumen market facilitating collusion**
High seller concentration	Four bitumen producing refineries in the region owned by six oil companies.
Few cartel participants	Six oil companies controlling all bitumen production in region.

[11] http://www.compcom.co.za/wp-content/uploads/2017/11/Competition-Commission-draft-guidelines-on-information-exchange-between-....pdf

Lack of buyer power	Bitumen buyers are fragmented and face inelastic demand.
High barriers to market entry -Large plants which require large upfront investments -Sunk investments costs - Enormous technological costs	High barriers to entry, bitumen production plants require large plants, sunk investment costs. There is little prospect of the construction of new bitumen plants in the region given the small domestic markets.
Large infrequent transactions	Bitumen transactions are large and infrequent in nature.
Annual market growth	Steady market growth.
History of cartel activity	The South African cartel was a legal cartel before market liberalisation. The 'rules of the game' were well established and persisted for a long time.
Industry association	All bitumen producers are members of the industry regional association SABITA.
Transparency of market prices to buyers including information exchange	Historic known bitumen pricing methodology in the region and well known pricing points. Private, highly disaggregated information exchange through SABITA.

Source: Author's construction

The implication is that these market characteristics are conducive to collusion in the other SACU countries, and given the history of collusion by the same firms in South Africa that supply the other SACU countries, it is very probable that the collusive outcomes (whether directly or indirectly) could have spread across the borders.

4.5 Quantitative data analysis

Bitumen traders (producers, value added manufacturers and importers) operate on a wholesale business-to-business basis, in which discounts are negotiated confidentially and individually. Therefore, pricing information is not publicly available, both from South Africa (Bester, 2014) and from the SACU member countries. As such, this dissertation uses trade data, reported in volumes and values, to make inferences about the pricing of bitumen in the region. As highlighted in the methodology Chapter, the trade data is from the UN Comtrade data. The data was collected for

the period 2000 to 2015. Data until 2015 is included to observe changes post prosecution of the cartel.

4.5.1 Pricing of bitumen in the SACU region

Given that the quality of penetration bitumen is largely homogenous and standardised, price is a major decision variable for any collusive agreement in the bitumen industry. As previously noted, actual transaction, prices are not publicly available as these are concluded independently by the different bitumen producers and or traders with individual customers. Bitumen prices are impacted by the same factors that impact global oil markets, such as significant geopolitical events. Therefore, global bitumen prices are strongly correlated with the global oil prices, as bitumen is a by-product in the oil production process. Consequently, it is expected that the price of bitumen fluctuates in line with the US dollar price of crude oil and the relevant exchange rate. However, on a localised level, bitumen prices are most significantly impacted by other factors such as product availability, storage capacity and shipping costs. Prices are also driven by the demand for bitumen, the number of on-going road infrastructure projects, government road infrastructure expenditure and refinery productivity levels (Interviews, 2019). In addition, the interviews revealed that bitumen prices are also affected by the locking in on long term contracts in the region (Interviews, 2020). The significance of this is that transactions associated with longer term contracts tend to have lower prices as would be expected.

Bitumen is a commodity typically characterised by seasonal demand and consequently, it reflects seasonal price volatility. The application of bituminous materials is restricted to periods of dry and warm weather conditions. This causes seasonal fluctuations in the demand for bitumen depending on the prevailing local climatic conditions. Moreover, in any given calendar year, bitumen refineries have to shut down for maintenance work and given that the Sapref refinery which is jointly owned by Shell and BP, has the largest bitumen refinery capacity in South Africa, prices tend to increase during its shutdown. The construction industry also shuts down for one month over December and January for their annual holidays thereby pushing the prices downwards due to the depressed demand environment (Interviews, 2019).

Typically, the demand for bitumen is driven by demand from road agencies and municipalities for construction works. However, it was noted that demand for bitumen in the region is primarily driven by donor funds from donor organisation, such as United States Agency for International Development (USAID) (Interview, 2019). This shows that the bitumen buyers' market in the region is fragmented and small, facing inelastic demand. This makes them less able to exert pressure

on suppliers to destabilise any cartel activity. The other key driver of the demand for bitumen is government expenditure for road construction, this also impacts on prices. Most road authorities and in particular local authorities (municipalities) tend to hold back on road maintenance expenditure until closer to their financial year-end, before issuing orders for the resurfacing of their respective roads, thus exerting upward pressure on bitumen prices (SABITA, 2007) and this creates lumpy demand.

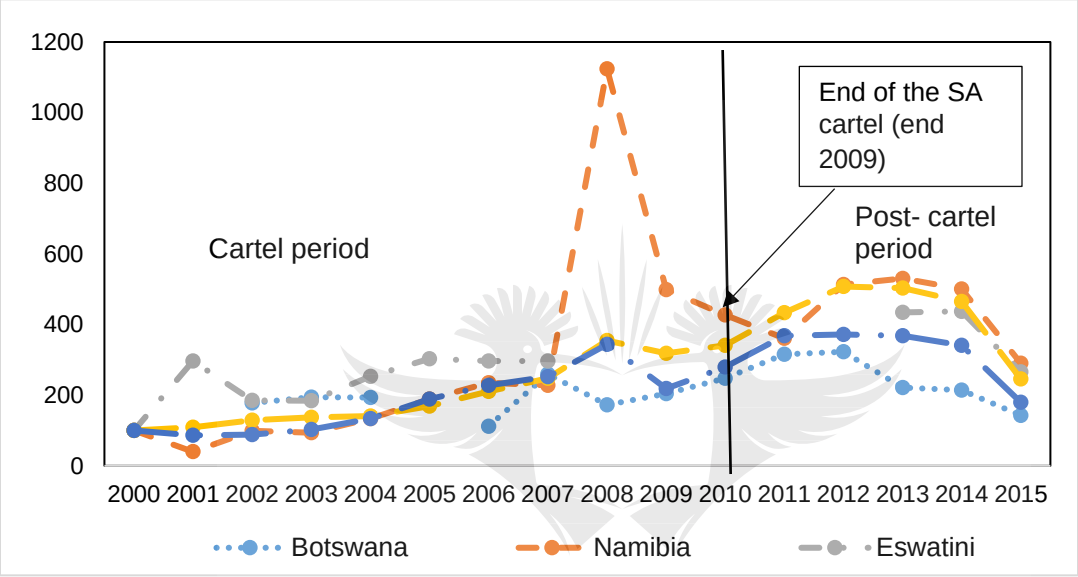
For the duration of the cartel, the interviewees were of the view that the bitumen prices to the SACU markets were set independently by the different oil companies. The interviewees were unclear on whether the jointly calculated bitumen index was used as the reference price in the export markets. However, while it is plausible that the oil companies determined bitumen prices independently, the history of the focal pricing points (Boshoff, 2015), also makes it probable that the same pricing mechanism used in South Africa could have been extended to the SACU markets. The interviewees were of the view that export prices were much lower than the domestic (South African) prices as the bitumen producers compete with other producer countries in the supply of bitumen to the SACU markets. However, this statement is to be taken with caution, given that the overall level of South African prices are much higher – a feature that reflects the long history of a legal collusion in this industry (Boshoff, 2015) and given that there is no competitive threat from other imports in the SACU markets as previously highlighted.

According to the interviewees, the payment terms by the SACU bitumen importers also favours imports from South Africa over imports from alternative sources. For bitumen imports from alternative sources, buyers typically pay 30% on order and the balance of 70% while the goods are in transit (with general average transit duration of 6 weeks reported). This is in comparison to much more favourable payment conditions from South African bitumen producers which also include credit terms for the buyers. It is clear from the interviewees that importing from other countries will have a negative effect on the importer's cash flows. In addition, it is more convenient to purchase from South Africa as it has reduced transit time due to the close proximity between the countries. The implication for this is that there is limited direct competition for the South African bitumen exports from alternative imports for the SACU region. Therefore, in the case of land locked countries like Lesotho, eSwatini and Botswana from a logistics point of view, it is impractical to consider other countries for alternative supply.

In the absence of individual transaction prices, it is not possible to verify the actual final pricing that customers are charged. The South African bitumen producers have a large degree of market

power which they have potential to exercise in the SACU market, given that there is no serious competitive constraint from other sources. Therefore, there is a case to be argued for the pricing mechanism being similar in the domestic and regional markets, and there is no indication (including from interviews with industry stakeholders) that different pricing formulas were used for local and SACU sales.

Figure 2: Comparison of the import prices with SA local prices and the crude oil price



Source: UN Comtrade data, Stats SA, Author's calculations

Figure 2 above plots five series: import prices indices for Botswana, Namibia and eSwatini, the South Africa bitumen price index and the crude oil price index. All the prices plotted above are in index form with the year 2000 as the base year. The calculation of the import prices is articulated in the Chapter 3. The data for Lesotho was dropped, as it had several missing values. As already indicated in the methodology section in Chapter 3, disaggregated (transaction) prices are more appropriate for analyses of cartels. However, such information is not available in the public domain and the only viable option is a price index which captures national prices. As such the import prices were in turn converted to index points with the year 2000 as the base year. The figure shows how the import prices moved over the years. As can be seen, and as would be expected, both the domestic South African bitumen price and the import price indices track the international crude oil price. While South African prices tracked international crude oil price increases till 2008, it is interesting to note the price stickiness downward when international crude

oil prices declined. After 2008, the South African index remained persistently higher than the crude oil price index.

The prices of bitumen (both domestic and import prices) rapidly rose in the early 2000s, peaking in 2007 before dropping in 2009 in line with global financial crisis. The prices rose thereafter in line with the global economic recovery. This shows that the bitumen prices tend to respond to developments in the global economy as expected. Figure 2 above also shows that for the duration of the cartel the import prices in SACU markets largely tracked the South African domestic bitumen price index in terms of general trends. There are however, differences in levels and certain anomalies as discussed below.

For the most part of the duration of the cartel, import prices for all countries were above the South African prices (except in the case of Botswana, discussed below). This implies that the bitumen price index in the SACU markets was higher than the South African price index which was already cartelised. The likely reason for this is that prices in the SACU countries followed a similar pricing methodology that was used in South Africa. However, the higher prices in the SACU countries can be explained by the additional transport, storage costs and other trade related costs.

After the prosecution of the South African bitumen cartel (post 2009), both the South African bitumen price index and import price indices in the other SACU countries continued to move together, tracking the crude oil price index. The implication is that the same pricing mechanism which mirrors crude oil prices continued to be used in the region. However, as noted above, the bitumen prices in South Africa post 2008 are higher than the international crude oil index and in the region possibly because of the increased demand in South Africa owing to large infrastructure projects leading up to the 2010 Soccer World Cup hosted in South Africa. Moreover, during that period a significant general spike in the costs of petroleum products was observed (Ross and Field, 2007), spurred by unprecedented growth in several of the world's largest countries (especially China). The lower bitumen prices in the SACU region could be explained by a possible lag effect in the sense that prices are locked in long term contracts and on the other hand, it could also be explained by the lack of cartelisation in the respective markets.

Botswana exhibits the most stable prices, while Namibia and eSwatini are characterised by more erratic price changes over the period. In particular, there is a noticeable peak in 2008 in the Namibian import prices. The driver of this anomaly is however, likely to be attributable to a measurement error as there is no other reasonable explanation for the one-time spike in the prices.

Interestingly, as previously noted, the import price index for Botswana was lower than the South African index in some periods. As will be shown in Table 7 Botswana was the only country of all the SACU member states that had sourced some of its bitumen requirements from other countries (China and US) during the cartel period.

A correlation analysis in Table 4 below also illustrates that the South African and the SACU prices have a strong positive correlation. There is a strong correlation between the price indices for South Africa and Namibia, and a fairly strong correlation between South Africa and eSwatini. While this is not surprising given the correlation with crude oil, it also suggests that pricing practices in South Africa may have spilled over to these countries. Although not conclusive, a high degree of correlation is a collusive trend marker (Harrington, 2006), as discussed in the literature review in Chapter 2. The correlation coefficient for South Africa and Botswana is much weaker, again raising the possibility that the imports from outside South Africa might have the effect of destabilising any possible cartel pricing in that country

Table 4: Correlation matrix SA bitumen index vs Import price index

Cartel duration (2000 -2009)	
Botswana	**0.41225**
Namibia	**0.87809**
eSwatini	**0.62002**

Source: Author's own calculation based on the UN Comtrade data

Post-cartel prosecution South African export volumes to the SACU region have continued to increase, relative to the cartel period as shown in table 7. The post-cartel export statistics are illustrated in table 5 below. Although the interviewees noted that there is increasing competition in the post cartel period (2010 – 2015) to the South African bitumen exports, the trade data proves contrary. The increase in the export volumes is an indication that even after the disbandment of the cartel, in terms of trade, business is continuing as usual. Therefore, this could imply that the status quo in the competitive dynamics within the region has remained the same with South African exports dominating these markets. This could be attributable to the factors discussed above such as the relatively shorter transport distances. The trade data below clearly demonstrate that there has been limited export penetration to the bitumen market in the SACU region from other countries, with exception of Lesotho whose import volumes remain low and insignificant compared to the rest of the region. Lesotho sourced some of its bitumen requirements from alternative sources, driven by bitumen procurement conditions for donor funded road construction projects. South Africa is therefore still an important source of bitumen for the SACU region.

Table 5: Bitumen imports in the SACU markets from South Africa

Summary of key statistics 2010 – 2015 (Post-cartel period)		
	Total value imported bitumen (USD)	% of the total bitumen imports (5 year average)
Botswana	7 329 704	96.4
Namibia	28 171 339	100
eSwatini	5 664 017	100
Lesotho	603 979	74

Source: Author's own calculations based on UN Comtrade data

The special case of Botswana

For the duration of the cartel period, (2000 – 2009) Botswana is the only SACU country which sourced some of its bitumen requirements from other countries when the South African bitumen cartel was operational. The actual bitumen figures that were sourced from alternative sources during years which the bitumen cartel was in operation in South Africa is depicted in Table 6 below. This is in comparison with the other SACU countries who sourced all (100%) of their bitumen requirements from South Africa for the duration of the cartel. The reason for Botswana importing from alternative sources could be conditions of donor funded road infrastructure projects or better alternative pricing. As discussed above donor funding for road infrastructure plays a significant role in the SACU markets. According to the interviewees, donor funders, at times dictate the countries from which bitumen is to be imported (Interviews, 2019).

The periods which Botswana sourced, some of its bitumen requirements from other countries corresponds to lower prices of imported bitumen for the country. The average import price differential between Botswana and that of Namibia and eSwatini is significant (as illustrated in Figure 2 above), however, it is possible that the differential may be biased due to the measurement error in 2008 and the base effect of using the year 2000 as the base year for computing the import price indices. The comparison of the import prices enforces the results of the correlation matrix which showed that Botswana had a low correlation to the South Africa prices. These points to potential evidence that where there is some, albeit small level of competition from sources other than South Africa, prices were lower during the formal cartel. This shows that donors may have countervailing buyer power (which is often absent in the region) and are able to get lower prices. This is an important competitive constraint to the South African bitumen producers (Interviews, 2019).

These results illustrate that a little competition for the South African exports had an effect of reducing the overall average prices compared to the countries that sourced all their bitumen requirements from South Africa. However, it is important to note that, these results are subject to certain limitations, as the conditions in the countries may not be directly comparable. Moreover, the analysis did not explicitly take into account other factors that affect import prices.

Table 6: Botswana bitumen imports (2000 -2009)

	Imports from South Africa (USD)	**Imports from the world (USD)**	**% of imports from South Africa**
2000	11 315	11 315	100
2001	549	549	100
2002	13 963	13 963	100
2003	245 731	245 731	100
2004	154 080	154 080	100
2005	72 455	72 455	100
2006	54 763	79 000	69
2007	72 346	102 000	71
2008	37 821	37 821	100
2009	135 488	173 000	78
2010	882 628	1 004 000	88
2011	1 316 895	1 446 000	91
2012	1 747 802	1 747 802	100
2013	563 197	563 197	100
2014	1 690 555	1 690 555	100
2015	1 128 627	1 128 627	100

Source: UN Comtrade data, Author's calculations

Conclusion on pricing assessment

While the analysis in this section is not conclusive evidence of collusion in the bitumen industry in South Africa extending to the SACU region during the cartel period. The presence of structural factors which are conducive for collusion and the dependency of the SACU markets on the South African exports for their bitumen requirements highlights that competition authorities in the region need to timeously investigate cross-border effects of cartel activity uncovered in another country in the region. This is even more important when the anti-competitive effects emanate from South Africa, given the country's economic importance in the region. The analysis points to red flags,

given the structural and behavioural characteristics discussed, and the significance of exports by the cartel members that the cartel conduct could have been extended to the region.

4.5.2 Quantifying the possible impact of the bitumen cartel in the SACU region

Growing interest in the impact of cross-border cartels has produced a number of important works in the field, for instance, by the OECD (2003), Levenstein and Suslow (2003), Connor (2001) and Yu (2003). Although purchases made by the SACU countries from the companies prosecuted for collusive behaviour cannot be observed directly, we can infer from aggregated trade data information on bitumen purchases and import price fluctuations.

To quantify the impacts of the cartel conduct potentially spreading into the SACU region, this dissertation takes imports of bitumen from South Africa as proxies of sales of the cartelised product to the SACU member states. Absent other available information, the trade data provides the best proxy of the cartel's impact on developing country consumers (Yu, 2003). There are very few studies of the economic effects of cross-border cartels, and there is no consensus on the correct way to measure these effects. In addition, data problems make this kind of analysis extremely difficult. Furthermore, it is not possible to measure accurately the impact on the market of a cartel, due to insufficient information on actual bitumen transaction prices after discounts.

Notwithstanding these difficulties, it is still possible to give an indication of the extent of harm. Given the magnitude of the trade figures shown in Table 7 below, it is possible that the cartel adversely affected a significant portion of trade in value terms and therefore the trade balances of the respective countries. If the cartel distorted the bitumen market in the wider SACU region, these countries would have suffered substantial losses in the form of welfare transfers from the purchasers to the sellers of the bitumen and deadweight losses.

During the period under review, South Africa was a net exporter of bitumen to the SACU member countries. As discussed in the qualitative section, the other economies in the SACU region do not have bitumen production capacities. In addition, it was also noted that there is no significant competition for the South African bitumen exporting refineries in the other SACU countries. Therefore, the SACU member countries are to a large degree dependent on South African refineries to supply their bitumen needs.

The trade data for the duration of the cartel (2000 – 2009) in Table 7 confirms that the South African bitumen exports faced insignificant competition in the SACU region as the countries imported almost all their bitumen needs from South Africa. This is further confirmed by statistics

published on the SABITA website which shows that local South African consumption was less than the local supply. Thus, the scale of production of bitumen in South Africa is far above the demand for local consumption as well as those of neighbouring economies. Therefore, it is clear that the SACU countries imported a large proportion of their bitumen requirements from South Africa.

Table 7: Summary of bitumen imported by the SACU countries from South Africa (2000 - 2009)

Country	Total value imported (USD) from SA	% of the total bitumen imports to country (average)	% of GDP
Namibia	8 564 605	100	0.161
eSwatini	839 943	100	0.034
Botswana	798 511	91.9	0.009
Lesotho	373 743	100	0.031
Total	**10 576 802**		**0.235**

Source: UN Comtrade data, IMF World Economic Indicators Database, Author's calculations

Following the approach of Levenstein, Suslow and Oswald (2003), Table 7 summaries import data for SACU countries. It is reported in three ways: in absolute US dollar values, as a percentage of total bitumen imports and as a percentage of the respective country's GDP. The GDP figure used are the figures for each corresponding year, after which the average over the period is reported in the Table 5 and 7. The total value of bitumen imports which could potentially had been a result of collusive pricing mechanism in the SACU member countries over the duration of the cartel amounted to approximately US$10.6 million. This is an aggregation of the total South African bitumen exports to all the SACU countries. The figure is significant and if the cartel had been extended to the region, it then implies that the impact was substantial. Therefore, it would warrant further investigations by the competition authorities in the other SACU countries.

In order to provide an estimate of the order of magnitude of the overcharge of the bitumen cartel, this dissertation uses Boshoff (2015) overcharge estimates calculated for the South African cartel case. Boshoff (2015) calculated the estimated overcharges to be between 18% and 20% over the years the illegal cartel was active (2000 – 2009), while taking into account that the cartel was previously a legal cartel.

If the cartel indeed extended to the SACU region, taking a conservative estimate of 18% price overcharge, the overcharge amount included in the total bitumen imports by the SACU countries

totalled approximately US$1.9 million over the duration of the cartel (Table 8). In other words, the SACU countries, on the more conservative measures, paid US$1.9 million more on average than they would have absent the cartel, and on the less conservative measure of 20%, they paid US$2.1 million. This potential overcharge of between US$1.9 million – US$2.1 million calculated by this study is an approximate estimate of the welfare loss due to the potential collusion. If indeed the cartel was extended to the SACU region, this impact was indeed substantial. However, any conclusions, about the effects of cartel activity need to be drawn with great care as this is an approximation of the direct price effects and any cartel activity could have had far reaching indirect effects when taking into account multiplier effects.

Table 8: Possible overcharges from the bitumen cartel in the region

Country	**Total value imported (USD) (2000 - 2009)**	**Possible overcharges (calculated at 18%)**	**Possible overcharges (calculated at 20%)**
Namibia	8 564 605	1 541 629	1 712 921
eSwatini	839 943	151 190	167 989
Botswana	798 511	143 732	159 702
Lesotho	373 743	62 274	74 749
Total	10 404 919	**1 903 824**	**2 115 361**

Source UN Comtrade, Author's calculations

4.6 Chapter summary

Bitumen is a by-product in the production of fuel. Therefore, the bitumen business decisions are susceptible to being taken at the group level in respect of the production of fuel. This increases the risk that pricing decisions could to have been taken at a regional level, as well as because the SACU member countries are likely be treated as extensions of the South African market. Given that the bitumen producers who were prosecuted for cartel conduct in South Africa accounted for nearly all of SACU market's bitumen supply, there is a need to screen and assess the impact (direct and indirect) that this cartel had on these markets. The analysis in this Chapter has illustrated that the SACU bitumen markets have structural and behavioural characteristics that are conducive for collusion. There are a few bitumen producers in the SACU markets, which facilitates co-ordination. Moreover, the producers have multimarket contacts given their interaction in several different fuel product markets in the petrochemicals industry. The trade data further illustrated that the SACU member states were almost wholly dependent on the South African bitumen exports for the duration of the cartel. In addition, the import trade data illustrated

that import pricing outcome in the region mirrors that of the domestic market. Analysis of potential damages to the SACU region shows that if the cartel was extended to region, the damages could have been substantial. This therefore warrants further investigations of the cartel members' conduct in the region.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

In the advent of globalisation and trade liberalisation, individual economies have become intrinsically linked. Therefore, anti-competitive conduct in one geographical location may have an impact in another geographical location. This is increasingly more evident in the area of cross-border cartels. In Southern Africa, given the trends in trade and investments between South Africa and the SACU member states there is a high probability that a cartel that has taken place in South Africa could have been also extended to other countries in the region (Kaira, 2015).

Despite the record fines and assured vigorous enforcement in South Africa, there is little indication that cartel activity is declining (Kaira, 2015). The continuous discovery of cartels in South Africa indicates that they remain relatively under-deterred. In part, this may be due to discovered cartels not being sanctioned in all jurisdictions where they caused harm and the sanctions not accounting for the harm in foreign markets. While the South African authorities have achieved relative success in unearthing and prosecuting cartels in the past few years, other competition authorities in the SACU region namely, the Botswana Competition Commission, Namibia Competition Commission and the eSwatini Competition Commission have not been as successful in this regard. There has been relatively little activity on the part of the other competition authorities in the region to respond to these cartels even after they have been uncovered in South Africa. Given that cartels tend to appear among domestic firms first, before going cross-border (Fear, 2006), the SACU national competition authorities and regional competition bodies like the CCC should proactively investigate these cartels.

Very little work has been done on the detection and screening for collusive arrangements between firms which cuts across national borders in Southern Africa. This is in stark contrast to the actions of the Canadian competition authority, which has consistently pursued anti-competitive cases against firms that have been investigated by the US Department of Justice (Levenstein and Suslow, 2003) in the neighbouring US. This has largely been on the premise of the close trade ties between the countries and the overlap of companies operating across the two countries.

Given that the South African Competition Commission does not consider a cartel's gains from other jurisdictions in the calculation of fines, it is imperative that the SACU competition authorities

timeously investigate any conduct that has possible links to its economies. This is more important given that two of the most stable cartels, the De Beers diamond cartel and the South African cement cartel, according to a study done by Levenstein and Suslow (2006) had their origins in South Africa. To effectively deter cross-border cartels, the competition agencies of neighbouring jurisdictions ought to become more active in investigating and ultimately prosecuting such cartels to sufficiently deter cross-border or multi-market cartels. The nature of economic integration between South Africa and SACU member states indeed warrants close monitoring of anti-competitive conduct developments by the SACU member states for any links to their respective economies.

The lack of prosecution by other countries in the SACU region may present problems to the efforts of detecting cartels in South Africa and in the region as a whole. If these cartels have significant effects on the SACU member states consumers and producers, the lack of antitrust prosecutions by these countries against these cartels is an important problem. This is, as geographically limited prosecutions do not provide sufficient disincentives to deter collusion that has region-wide benefits for colluding firms. Therefore, given the low levels of prosecution outside South Africa in the SACU region, consideration should be given on calculating fines in South Africa routinely on the basis of the cartelised market having a direct or indirect impact in the region to sufficiently deter collusion in all markets. In addition, it is important for the South African authorities to consider an enhancement to the current leniency programme which would reward firms in the form of related immunity, if they inform the authorities on collusive activity in any of the SACU markets that are not yet under any investigations.

Apart from Lesotho, all the SACU member states have enacted competition laws and have an operational competition authority. Lesotho has a draft competition law and at the time of writing it not have a functioning competition authority. The Minister responsible for Trade and Industry in Lesotho announced that the country is in the process of drafting a competition law to pave way for the formation of a competition commission[12] organisation. All the competition laws in the SACU region include specific anti-cartel provisions. Cartel conduct is per se illegal in all countries with competition laws in the region but enforcement has been relatively weak, with little activity done in this regard. This means that the mere existence of collusion is enough to satisfy a finding against the firms involved without necessarily considering any mitigating circumstances. Although the competition laws of specifically Namibia and Botswana apply to all economic activity within

[12] https://lestimes.com/competition-laws-beckon-for-lesotho/

the countries or having an appreciable impact on the country's economies, there has been little initiative to follow up on cartel activity emanating from South Africa.

This study used the bitumen cartel that was uncovered and prosecuted in South Africa to demonstrate using screening mechanisms for a cartel to determine if the cartel uncovered in South Africa could have had an appreciable impact on SACU members' respective countries'. Structural and behavioural factors facilitating collusion in the bitumen industry in the SACU region were reviewed. The study found a myriad of structural and behavioural factors that are conducive for a cross-border cartel. The trade data demonstrated the SACU member states' dependency on South Africa for their bitumen requirements. In addition, the import pricing data derived from trade data mirrors that of the South African bitumen prices. Together these factors suggest that there is a strong possibility that the effects of the cartel were felt in the region and that collusive pricing could have been extended region-wide. Given that the arrangements between the bitumen producers have shown potential to undermine rivalry, as well as the history of cartel conduct in South Africa, this in itself is an important red flag for the competition authorities in the region to consider. This increases the possibility that the bitumen cartel in South Africa could have been facilitated in the region by proximity of the markets and the membership of the common customs union which makes the movement of goods between South Africa and its SACU neighbours easier. In addition, various cartels have also existed in the bitumen industry internationally, which have had cross border elements. In Europe, cartels in the bitumen industry were uncovered and prosecuted in the Netherlands, Spain and Belgium. Of particular importance to this study, the cartel in Spain had an appreciable impact to other countries in the European region. In terms of the bitumen cartel uncovered and prosecuted in South Africa, investigations have not been extended to markets in the SACU member states to inquire whether these markets were cartelised or directly affected by the cartel uncovered in South Africa.

While the analysis that is done in this paper does not provide conclusive evidence of collusion, the patterns identified in this paper warrant further in-depth investigations in which data which is more detailed can be collected. The analysis presented in this paper is innovative in the use of trade date to compute import price indices for pricing analysis and for calculating the impact of the cartel, but there are limitations to its scope and quality. This paper simply demonstrated that basic screens of structural and behavioural factors conducive for collusion and a review of pricing trends derived from trade data in the absence of direct transaction prices could be used to determine if a cartel emanating from South Africa could have had appreciable cross-border effects. These can serve as a trigger for local investigations in the respective SACU member

states and facilitate cartel detection, therefore increase the deterrence rates. The formal investigations could then facilitate for the collection of data directly from the exporting and importing companies (disaggregated data), for analysis of the trends and to acquire direct evidence of collusion if it is confirmed. In the absence of leniency applications, SACU countries are more likely to recognise the existence of cross-border cartels through enforcement activities emanating from South Africa. This will also require increased cooperation between the competition authorities in the region and processes and platforms, such as the African Competition Forum, to share information between competition authorities.

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ANNEX

Annexure 1: Settlements from the bitumen cartel

SABITA	R500 000	< 10% annual income from membership fees
Engen	R28 800 000	<10% of its total income and exports from South Africa for the 2009 financial year
Shell	R26 259 480	< 9% of its total income and exports from South Africa for the 2009 financial year
Masana Petroleum Solutions	R13 000 000	
Sasol	R0 (granted conditional immunity)	
Tosas	R0 (granted conditional immunity)	

Annexure 2: Ethical clearance

CBEREC and SUBCOMMITTEES 2019 May 20

SCHOOL OF ECONOMICS

Dear Student: Precious P. Dube

ETHICAL CLEARANCE GRANTED FOR RESEARCH PROJECT

This letter serves to confirm that that the proposed research project entitled "An evaluation of the cross-boarder nature of cartels:the case of Bitumen in Southern Africa" has been granted ethical clearance by the School of Economics Research Ethics Committee, Please refer to the report below for the ethical clearance number and specified conditions of approval.

ETHICAL CLEARANCE REPORT

Applicant	Precious Peloentle Dube
Supervisor	Ms Reena Das Nair
Student/staff number	200720222
Title	"An evaluation of the cross-border nature of cartels: the case of Bitumen in Southern Africa"
Decision date at meeting	20 May 2019
Decision at Department / School	
Decision at College Meeting	
Decision at CBE REC	
Reviewers	Bulelwa Maphela
Ethical clearance code	2019CCRED04
Rating of most recent application	CODE 01

CODE 01 -	Approved	CODE 02 -	Approved with suggestions without re-submission
CODE 03 -	Not approved, may re-submit	CODE 04 -	Not approved, no re-submission allowed

RESEARCH COMPLIES WITH	COMPLIANCE	NON-COMPLIANCE / DETAILS / RECOMMENDATIONS / CONDITIONS OF APPROVAL

Annexure 3: Questionnaire topic guide

1. Mapping the competitive landscape

a. Describe the competitive landscape of the bitumen industry in the SACU region countries.
b. Map out the value chain for penetration grade bitumen.
c. Who are the main industry suppliers in each SACU country? What is their ownership structure?
d. Is there local production capacity?
e. What is the market share of each player in each country? (Please specify if this share is in terms of capacity, production, sales volumes or values).
f. What are the demand and supply dynamics in the respective countries?
g. Who are the main customers of penetration grade bitumen?
h. What are the other sources of imports?
i. Have there been any new suppliers of penetration grade bitumen in the past 10 years?

2. Pricing mechanism and price levels

a. What is the pricing mechanism for penetration grade bitumen at the wholesale and retail levels?
    i. What is the pricing formula?
    ii. How are the components determined?
    iii. Are international benchmarks used? If any, please specify them.
    iv. Are discounts offered off a list price? How are these determined?
b. Has this mechanism and/or formula changed in the last 10 years?
    i. If so, what were the changes?
    ii. What were the reasons for the changes?
    iii. Where the resultant prices higher or lower than they would have been under the previous mechanism?
c. What are the reliable sources of data for bitumen and bituminous products in each country in the region?
d. What data is publicly available on bitumen prices?
e. Does regulation affect the price at any level of the value chain in each country?

3. Trade and transportation of bitumen

a. What proportion of total bitumen demand is imported from South Africa in each country?

b. Do the primary producers of bitumen in South Africa export directly to the other countries in the SACU region? Do they have agents? Do they sell to wholesalers?
c. What are the arrangements with regards to transportation of bitumen across the region?
d. What are some of the transport-related costs involved in exporting to each country?
e. Are there any non-tariff barriers that add to the price of bitumen exported from South Africa?